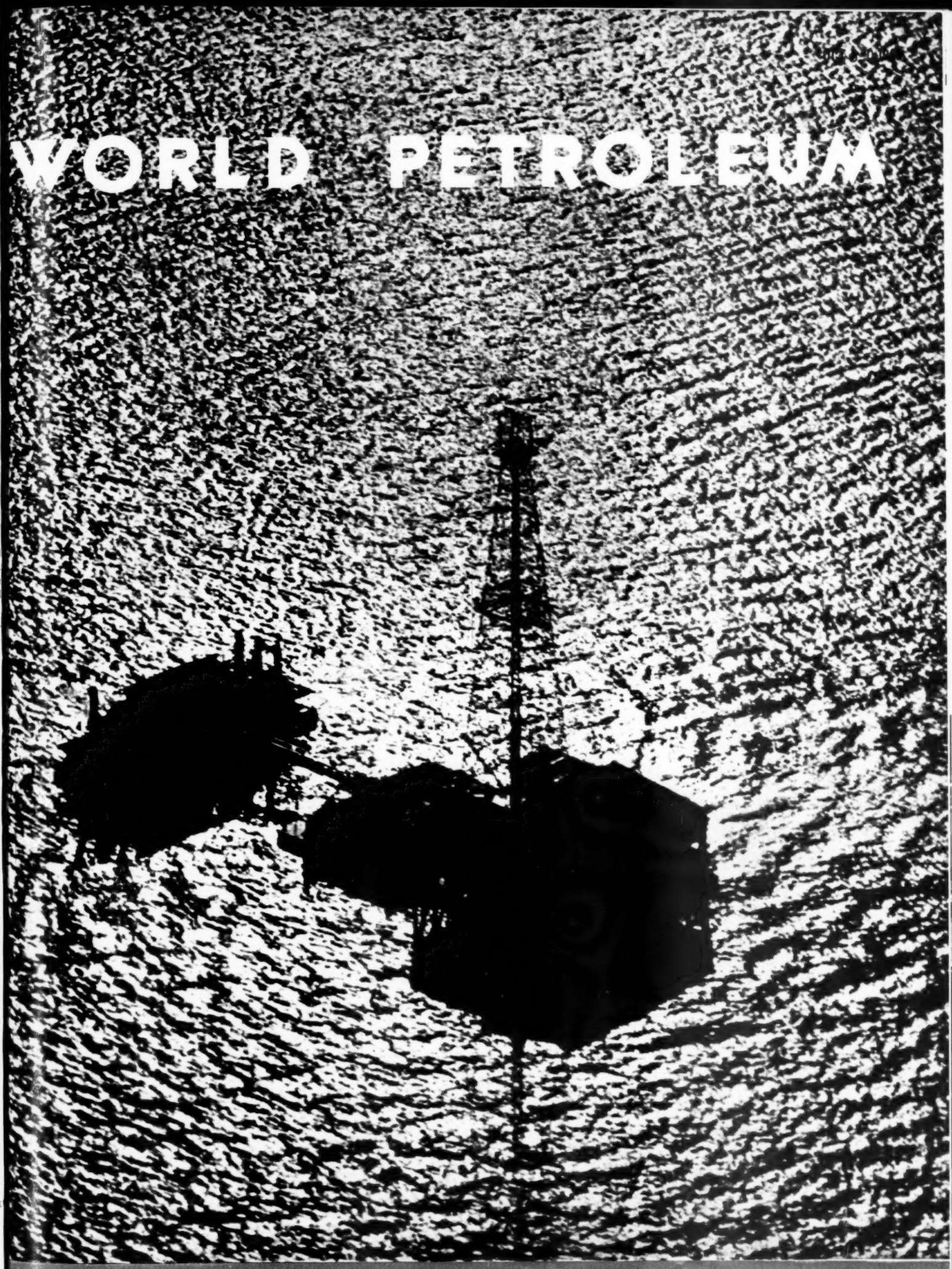
WORLD PETROLEUM



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Cover: Drilling in Galveston Bay. Photo by R. L. Browning, Texas City, Texas

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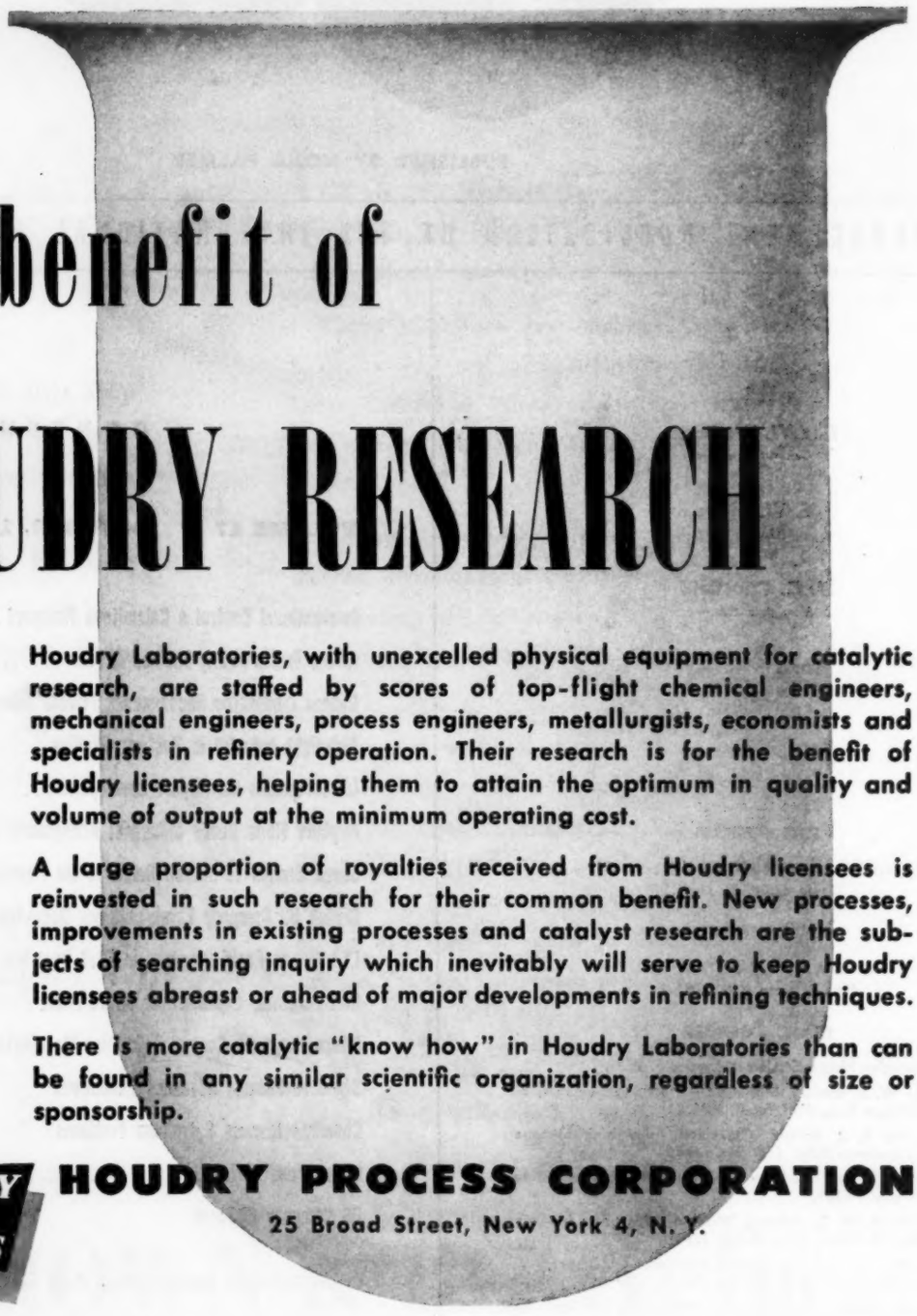

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EDITORIAL

INTERNATIONAL CONTROL A CALAMITOUS PROSPECT

Some sharp criticism has been expressed of a broadcast in mid-August in which State Department representatives expressed guarded approval of a world organization with authority to regulate production and distribution of oil. While they were speaking unofficially their remarks tended to confirm the belief that the administration is favorably disposed toward some form of international control. In this connection it must be remembered that from the time when the discussions leading up to the negotiation of the Anglo-American oil treaty were initiated, it was stated that it was to be only a first step toward the formation of a world conference that would include both producing and consuming nations and would deal with a wide range of questions affecting the international oil industry. The purpose of establishing such a world organization has been kept in view through all the changes in the Anglo-American convention and is reiterated in the current draft that is now before the Senate.

While no precise outline of the functions and authority of a world oil conference has been put forward a pattern for it was provided in a different field by the food conference which met at Hot Springs, Virginia, during the war and by other international projects encouraged by the Roosevelt administration. The mechanism for instituting consideration of the world oil situation is provided by the Economic Council of the United Nations which in due course may take up the subject.

As envisioned by John A. Loftus, chief of the Petroleum Division of the U. S. Department of State, in an address which he delivered recently at the University of Pittsburgh, an international oil conference, acting under authority of the United Nations and composed of official representatives of governments, might review the terms of concessions to oil companies and recommend their revision; nations feeling that they had inadequate access to oil supplies or objecting to the prices they were required to pay could appeal to it for relief. Objectives of the organization might be to eliminate tariffs and other trade obstacles, to put an end to cartels and restrictive agreements, to encourage small as well as large companies to participate in oil development outside the borders of their own countries, to insure the even distribution of products so that the distinction between have and have-not countries would be wiped out and to substitute for bilateral bargaining over concessionary rights a uniform basis of law governing the acquisition and exercise of control over oil resources.

It is difficult to visualize such a system in operation but if it were in effect it obviously would make the exercise of private initiative impossible and the investment of private capital in oil ventures too hazardous to be attempted. If every nation that felt itself inadequately supplied with oil could enter a demand for control of deposits which would have to be surrendered by some owner or nation that had acquired them in a perfectly legitimate manner the resultant clamor would scarcely be conducive to peace and friendliness. One can scarcely imagine the Soviet Union, for example, or any one of a number of other nations for that matter, accepting the suggestions of an international tribunal as to how and where its oil products should be used. Countries in which governments themselves conduct their oil industries, fix the prices of products or maintain cartel agreements would hardly be likely to relinquish the advantage which they believe to accrue from these systems. To one conversant with the conditions surrounding the international oil industry the project for its control along the lines indicated appears chimerical and one that if attempted would lead to more intensive rivalries than those that now exist and would seriously hamper the orderly development of the world's oil resources.

The reasons advanced for American participation in a plan for international control of oil are a prospective shrinkage of the oil reserves of the United States and the likelihood that under such a plan the nation's share in outside oil resources would be increased. As to the former, men of long practical experience in the industry have pointed out that there is no reason for the assumption that the country will encounter a shortage of products within the foreseeable future and that warnings of the impending scarcity of supplies overlooks the constant growth in the size of oil reserves and the possibilities of utilizing natural gas, shale deposits and coal distillation. As to the second, American oil men have been highly successful in acquiring rights to recover oil in other parts of the world, with, or more often without, the support of their government. A national policy based upon the energetic defense of the legitimately acquired rights of its nationals abroad, with fair treatment to all interested parties, would seem to have much greater assurance of success than could come from involvement in an international organization subject to all the conflicting interests and ambitions therein represented and the certain prospect that national rivalries would be accentuated rather than reduced. Such a policy would offer much less risk of embroilment in controversies in which the United States as a nation has no direct concern.

The first job of this executive transport, delivered last spring by Beech Aircraft Corp. to Sun Oil Co., was to pick up J. Howard Pew, Sun president, who was stranded in Chicago by the railroad strike.

AIRLINE TRAFFIC NEARLY DOUBLED IN YEAR

By W. J. MADDOX

FROM January through June of 1946 the airline carriers in the United States transported 5,225,299 passengers or over 89 percent more than in the corresponding period in 1945. For these first six months revenue miles flown reached a total of 151,472,736, an increase of more than 57 percent over 1945. Revenue passenger miles were up more than 80 percent to a total of 2,607,131,528.

Express and freight shipments by air produced a total of 13,482,633 ton miles, representing a rise of over 13 percent in the United States; internationally they rose 31 percent. There were over 600,000 shipments as compared with a little more than 536,000 for the corresponding period in 1945. Airmail dropped nearly 45 percent to 17,833,127 ton miles, due chiefly to the disappearance of soldier mail.

The overseas airlines of the United States were setting up equally spectacular marks in the first half of 1946. The number of passengers probably totalled more than half a million. Accurate figures even for the early part of the year have been impossible to obtain, for one thing because of the phenomenal rate of expansion and also because of considerations involved in negotiations with a number of foreign countries where disputes centered around frequency of schedules.

Up to late summer of 1946 the safety record of the airlines in both domestic and overseas operations had been extraordinary, in spite of the tremendous expansion of traffic and routes with vast quantities of new equipment and new employes. As of September 1st there had not been a single fatal accident on the scheduled flights of United States carriers in the international service, embracing routes to every part of the earth except Russia and certain areas of Asia. The domestic carriers experienced four fatal accidents involving the deaths of 13 crew members and 55 passengers. This is an estimated rate of 1.8 passenger fatalities per 100,000,000 revenue passenger miles, as compared with 2.1 for the entire year of 1945 and close to the all-time low of 1.3 in 1943, when operations were not nearly so extensive.

In spite of priority given to safety, appreciable progress was being made toward the goal of all-weather flying. The percentage of scheduled miles actually flown rose from 93.45 for the first six months of 1945 to 95.80 for the corresponding period in 1946. In June the figure had reached 97.70. Even though wartime urgency could have been expected to be relaxed somewhat in maintenance work, the utilization factor for planes rose slightly from 10.52 hours per day to 10.55 hours. The passenger load factor on the most heavily travelled routes remained close to its wartime peak in spite of multiplied schedules and planes, but the average for the entire country was dropping, as expected, although only from 87.76 a year ago, to 84.18.

The year 1946 bid fair to be historic for air transportation in many other respects besides traffic volume. Domestic routes reached an all-time high total of more than 77,000 miles as of late August, or an increase of about 10,000 miles since the end of 1945. International routes authorized for United States carriers exceeded 177,000 miles, radiating from 21 United States cities to every section of the world.

Four-engine planes first went into regular service on the domestic routes. Domestic airmail rates were reduced to five cents an ounce. The first so-called "feeder" lines were authorized by the Civil Aeronautics Board. The bill for approximately doubling the number of airports in the United States, implementing the program of the CAA, was finally passed toward the end of the 79th Congress—a billion dollars for about 3,000 new airports and improvements to about 1600. Airline stops authorized by the CAB had reached a total of 523, of which 105 were not operating because of local conditions.

The number of planes operated by the scheduled airlines reached an all-time high by mid-summer. The total in service was 597 domestically and 142 internationally—an aggregate of 739. This compared with 414 domestic and 102 international at the end of 1945. The pre-war figure in 1941 was 359 domestic and 94 international. The low point had been reached in May of 1942, when the domestic fleet had been reduced to 166 by requisitions of the Army and overseas commercial operations had practically disappeared. The number of aircraft anticipated to be in service within the next year or two, both domestic and international, as reflected in orders and options announced by the airlines, was close to 1400 with an estimated seating capacity in excess of 50,000.

The growth of air transportation is dramatically revealed in the figures of traffic volume. In 1926, the domestic airlines carried 5,782 passengers. In 1945 they carried more than 7,500,000. Revenue miles flown in 1926 were 4,256,771. In

1945 the figure was nearly 215,000,000. Mail ton miles in 1934 were 2,461,411 and rose to over 65,000,000 in 1945. Express and freight ton miles in 1935 were 1,089,802 and in 1945 reached the mark of nearly 23,000,000. Overseas operations in 1945 had reached the total of 784,835 passengers; 37,866,695 miles; 522,764,809 passenger miles; 4,852,466 ton miles and mail: and 9,259,136, ton miles of express and freight.

Since the early days of scheduled air transport in 1926, when two or three passengers were the rule and 100 mile an hour speeds were unusual, the advances in aviation boosted the post-war plane capacity in 1945 to an average of over 20 seats and speeds to more than 180 miles an hour. The new post-war planes seated as many as 59 passengers and reached cruising speeds of about 300 miles an hour. Fares were gradually reduced from 12 cents a mile in 1926 to four and a half cents in 1945.

The amazing growth of air transport is also reflected in the figures for fuel consumption. In 1930, the first year for which comparative statistics are available, domestic airlines consumed 11,456,065 gallons of gasoline and 371,459 gallons of oil. In 1944 these figures had jumped to 88,143,632 and 1,238,941, respectively. The international carriers in that same year consumed 3,092,412 gallons of gasoline and 81,493 gallons of oil. Their 1944 figures rose to 16,912,705, and to 270,512, respectively. In 1930 the gasoline consumption of the domestic airline per plane per year was 23,000 and in 1945 it had risen to 384,000. The advance in passenger carrying was shown by the fact that in 1930 the number of gallons consumed per million passenger miles was 136,000 and in 1945 had dropped to 38,000.

Atomic power, or even jet propulsion, may not be speeding the ordinary air traveler through the air five years from now. But air transport is leaping skyward with such amazing energy that it seems already impelled by the unleased forces of the future. To what heights will it rise as the century passes its half-way mark? Here are some answers based on the conclusion of men who have given careful study to the question.

Of the fleet of approximately 1400 planes, about one-quarter will be in international service. The aircraft will be of the same general conventional type now becoming familiar to the public, with two or four engines located on the forward edges of the familiar type wings. Some of them will be considerably larger than any now in commercial service. Their outstanding characteristic,

Above: In Socony Vacuum Oil Company's fleet of 14 planes in domestic U. S. service there are three 5-place Beechcraft executive transports.

Center: Four-place planes recently delivered to Standard Oil Company (Indiana) by Stinson division of Consolidated Vultee.

Right: Cocktail lounge on the lower deck of a Boeing Stratocruiser. A circular stairway leads to the upper deck.

however, is a trend not so much to giant size as to greater speed, economy of operation and passenger comfort.

Outstanding engineering improvements will include wing construction affording greater strength and better airflow; thermal de-icing systems by means of which "hot" wings and control surfaces will prevent ice from forming; landing gear which will facilitate cross-wind landings; fully reversible propellers which will permit shorter landing runs and increase maneuverability on the ground. Present reciprocating engine power plants will still prevail in increasingly efficient form. Some of the latest craft off the production line will have gas turbine engines, driving propellers of improved design. A few will employ jet propulsion as auxiliaries to assist take-offs and for cruising at high speeds and altitudes.

Specialization of planes will be a feature of the airline fleets. There will be several categories, each best suited to its particular mission. Principal among these will be: 10-15 passenger capacity for the smaller "feeder" lines; 20-25 passenger capacity for the smaller trunk lines; 40-60 passenger capacity for main trunk lines; 100 plus capacity for trans-ocean lines; all-cargo planes.

The all-cargo planes will be specially designed as such, providing not only for increased capacity, but also for greater speed in loading and unloading and protecting perishables. Many of them will permit insertion of large pre-loaded containers. For the most part, however, the planes will be combination passenger and cargo carriers. In this respect the chief departure from present models will be a flexibility in speedy adjustment of space for passengers and cargo to meet the needs of varying schedules. There will be planes for an expanded "pick-up" service, on some routes carrying passengers and cargo.

There will be accommodations to suit the pocket books and desires of many types of passengers. The current controversy worrying the industry will be resolved in favor of both schools of thought: those who see the airplane as a medium of mass transportation and those who cherish it as a deluxe carrier. There will be cabins where they pack 'em in for short and medium length hops. These planes will meet the wishes of passengers whose chief wish is to get there most quickly and at least expense. At the sime time there will be planes of great spaciousness with varying combinations of seats, including arrangements for card tables, drawing rooms, berths, lounges, double decks and observations parlors. Some of these will command extra fares, while many will provide a happy medium for all comers. For the longer flights practically all planes will have pressure cabins, which provide 8000 foot comfort at stratosphere altitudes, "above the weather," where there are no storms or rough air. Laps will give way to tables for service of meals, which will be cooked en route or prepared with equal variety and flavor from precooked and frozen food. There will be wide choice of menus. Seats will be even more comfortable, lighting more efficient and ventilation more satisfactory than prevail even in the early post-war models. Provision of two hostesses on the larger planes will speed the service of meals and the handling in transit of many flight details which heretofore consumed passengers' time on the ground.

Routes will expand by thousands of miles to fill in the existing framework both domestically and overseas. In the former areas the outstanding feature will be the extension of service to smaller communities. Internationally, the Civil Aeronautics Board's designation of North Atlantic terminal points within the United States is highly significant of the passing of the notion that an international airline ends at the coast line and that an airport need necessarily coincide with a seaport. The terminal points named were Chicago, Detroit, Washington, D. C., Philadelphia, New York, Baltimore and Boston.

Schedules will be vastly multiplied. On the most heavily travelled domestic routes the flights will approach trolley car frequency with no requirements for advance reservations. Airways will enjoy practically complete fulfillment of the war-born promises which at first seemed so slow of realization. The miraculous scientific devices which had their baptism in military operations will be in general daily use. There may be many instruments still newer and better, but widespread, practical utilization of the war wonders will make all-weather flying a reality. Airports will be built or revamped to meet the current needs. Mere super-size will not be their chief characteristic. Rather, they will be adapted to meet maximum traffic requirements at their particular locations and be designed to permit relatively easy expansion.

Traffic will reach astonishing peaks, probably at least five-fold the pre-war figure on domestic routes and eight-fold on international routes. This is one of the hardest concrete predictions to make because most forecasters employ varying bases for calculations. The figures which follow are a pooling of estimates, taking into consideration the factors involved in the extremes of optimism and pessimism.

Passengers—domestic:	**17,000,000**
overseas:	**1,700,000**
Passenger miles—domestic:	**10,000,000,000**
overseas:	**1,800,000,000**

Mail—all first class when it can be delivered more quickly by air (probably distances over 300-400 miles), with also the addition of air parcel post.

Ton miles—domestic:	**87,000,000**
overseas:	**8,600,000**

Cargo—including express and freight. Relatively light manufactured articles, medicines and other emergency shipments, publications, and articles of high value will in all likelihood constitute the major portion. Shipments of perishables will increase greatly in volume but will probably account for a comparatively small percentage of the total.

Ton miles—domestic:	**110,000,000**
overseas:	**25,000,000**

The history of air travel thus far has been the story of a transition from luxury to mass transportation by air. The impetus to travel by air has been so great that in the difficult reconversion period the airlines admittedly have had their hands full in meeting the demand. The science of aeronautics can meet the wildest dreams of the imagination. Practical airline operation will soon be able to do the same. Then will come the test as to whether the travelling public will demonstrate the boundless urge to fly which is now in evidence. All signs indicate that the air age is only at the take-off.

This is Consolidated Vultee's idea of the passenger plane of the future powered by six 5000 hp. motors and carrying 200 passengers.

Today's workhorse of the commercial airlines is the DC-3. Public interest in aviation is seen in crowds of spectators at all airports.

RUBBER COMMITTEE RECOMMENDS PRIVATE INDUSTRY OPERATION

COMPLETING its study of conditions in the rubber industry and its recommendations for dealing with the synthetic rubber plants erected during the war the Inter-Agency Policy Committee on Rubber, through its chairman, William L. Batt, representing the Office of War Mobilization and Reconversion, submitted the final section of its report just before the adjournment of Congress. A preliminary report made public earlier in the year reviewed developments during and before the period of war emergency and advised the continued operation of all the more efficient butadiene and copolymer plants so long as natural rubber remained in short supply, a period that was estimated to extend until the end of 1947. Thereafter it proposed that under privately owned plants provide a minimum yearly output of 250,000 tons of GR-S rubber.

In its later report the committee details its reasons for preferring private rather than government ownership of synthetic rubber facilities, points out the action needed by Congress to assure the existence of the industry and discusses various methods that might be employed to enable synthetic production to meet the competition of natural rubber under conditions that might arise after supply overtakes or exceeds demand.

Discussing the post-war era the committee says:

"It is impossible at this time to predict the direction which synthetic rubber development will take. It may be that the present GR-S can eventually be made so cheaply and of such improved quality that it can compete in a free market with natural rubber. It is also possible that some new way of combining butadiene and styrene may yield a product superior to the present GR-S. Development of other already existing synthetic rubber types or discovery of some totally new monomers or polymers may likewise prove fruitful. It is possible that the solution to the national security problem may lie in the development of numerous synthetic rubbers, each fulfilling some specific end-product quality need. Thus there may never be a wholly adequate general purpose synthetic rubber. The committee feels that the development of 'tailor made' synthetics should not be prejudiced by creating a preferential position for GR-S types. . . .

"At the time the government embarked upon its synthetic rubber program, there was no synthetic rubber industry of any consequence in this country. Patent rights in this field were held by a number of domestic and foreign companies. The imperative needs was for rapid production of known synthetic types of rubber by a cooperative effort of industry as a whole. To mobilize the efforts of the various chemical, petroleum and rubber companies possessing experience, technical data and patent rights in the butadiene, styrene and copolymerization fields, the government consummated a series of agreements providing for the exchange of technical information and patent rights. These agreements provide a basis for the cooperation of the participating companies in the development of improved processes and products and are indispensable in minimizing the government's liability for infringement of patents.

"It is, nevertheless, the consensus of the committee that its recommended program of creating competitive conditions within the industry conducive to the maximum of research may be impeded by the continued technical information exchange and patent cross-licensing provisions of these agreements as to new developments. To the extent that the present agreements prevent private enterprise from enjoying exclusively the fruits of its future research under the protection of the patent system, they may restrain competitive operation of the industry and inhibit the development of new processes and new polymers.

"Qualified technical experts in the field of synthetic rubber research have advised the committee that the exchange of information required by the government-sponsored patent agreements will retard the search for new polymers. The committee's recommendation that the government's styrene, butadiene and copolymer plants be offered for disposal may be impeded insofar as the incentive to acquire such facilities is inhibited by the various patent agreements. The committee believes that the termination of the government's patent agreements as to new developments should, if possible, be coordinated with disposal in order to free their signatories, who acquire synthetic rubber facilities, from the patent and information exchange provisions. Competitive exploitation will lend impetus to the perfection of new and better polymers."

"Recognizing that if private industry is to carry on the production of synthetic rubber it must have some assurance of a stable price for its product the committee examined a number of instrumentalities for accomplishing the result. An obvious measure is a tariff on imported rubber which is characterized by the report as the traditional method of protecting infant American industries from foreign competition. Against it is the objection that it runs counter to commitments regarding free entry of natural rubber and that it would tend to raise prices.

Imposition of quotas on rubber imposts is dismissed as violating trade agreements between the United States and certain foreign countries. An excise tax on rubber articles is ruled out on the same grounds that apply to a tariff except that it would not be a direct violation of trade agreements. A government monopoly of the purchase and sale of natural rubber is said to be open to the objection of violating the purpose of restoring the industry to private operation and providing an excuse for other nations to adopt a similar policy. A suggested certificate plan which in effect would be a variation of import quotas was held to involve complexities in marketing operations and to be open to the same objection as the establishment of import quotas.

A proposal for setting up an industry code under which manufacturers would enter into an agreement to use specified quantities of synthetic rubber or to use specific amounts in particular products was rejected on the grounds that a matter involving national security should not be delegated to private interests and that its enforcement by government sanctions would be questionable from the standpoint of public policy.

Elimination of these various suggestions left only a choice of two alternatives so far as the Committee's deliberations revealed. One of these would be a subsidy to producers or users which might take the form of a direct bounty on the poundage used, reimbursement of losses incurred in the sale of synthetic products or government purchase of the synthetic output on a basis profitable to manufacturers and its resale on a basis competitive with natural rubber. The other would be a product of specification plan under which the minimum quantity of synthetic to be included in given products would be established by the government. Like all other proposals this one is acknowledged to have certain drawbacks but is regarded as possessing the advantage of providing an assured synthetic market.

Appreciating that determination of the system is a matter for action by Congress the committee satisfied itself by presenting the favorable and unfavorable features of each but it submitted the following recommendation:

"If it were necessary to make a decision today on the best method of governmental support, the committee would favor use of product specification or subsidy, or a combination of both, to the exclusion of other methods. The majority would toward a combination of both."

In substance the recommendation of the committee is that the more efficient low cost butadiene, styrene and copolymer plants be sold as promptly as possible to companies in a position to assure continued operation of the plants, that provisions to make possible the production of a specific amount of synthetic rubber be made by Congress and that a supervisory federal body be established to administer these provisions.

AIRFREIGHT INDUSTRY IS POSTWAR PRODIGY

IN HIS day the late T. B. Slick was a spectacular figure among independent producers in the Mid-Continent fields. Developments of the past few months suggest that his 25 year old son Earl F. Slick of San Antonio, Texas, possesses the same drive and willingness to risk his capital which characterized his father's wildcatting ventures.

Earl completed three years of service as a pilot in the Army Air Forces last December. He teamed up with another army man as soon as he left the service to organize Slick Airways, Inc., and three months later actually began carrying freight by air. That first month Slick planes carried 61,247 ton miles of revenue cargo. In April, the second month, business was 243,212 ton miles. It doubled again in May and by August had reached the astonishing total of 1,474,691 ton miles for that one month. By way of comparison, the 21 scheduled air lines in the United States carried 2,250,000 ton miles per month in the first half of this year.

By August Slick Airways was operating ten C-46 Curtiss Commando planes with a cargo capacity of 5.5 tons per plane. The company now is asking the Civil Aeronautics Board for certification as a common carrier.

While the Slick venture is spectacular in its swift growth it is not the only example of a G. I. back from the wars who has entered the air freight business. One of the earliest of the non-scheduled, non-fixed-base carriers was National Skyway Freight Corporation, known also as the Flying Tiger Line. This company is headed by Robert W. Prescott of Los Angeles, who resigned from the U. S. Navy in 1941 to join the famous Flying Tigers in China. When this group disbanded he got a lot of air freight experience transporting cargo over the Himalayan Hump. Another is Willis Air Service, Inc., of Teterboro, N. J., headed by another Navy airman Charles F. Willis, Jr. This line carries freight from coast to coast and from Florida north. An overseas division operates in Columbia, Cuba and other Caribbean areas.

First of the ex-G.I. lines was organized less than 18 months ago. Today there are nearly 300 air freight individuals or firms (270 in May) operating 559 cargo planes of DC 3 capacity or larger. This compares with 597 domestic planes operated by scheduled airlines. At the rate the group has been growing the number of planes in the independent freight service may soon exceed the number operated by the scheduled lines. Freight carrying capacity of the 559 independent planes is estimated at five million ton miles per day. In other words the independents operating with full loads could carry more freight in three days than was carried in the first half of this year by all scheduled airlines. It is no secret that the independents are not working at capacity. Officials of the Independent Airfreight Association, Inc. suggest that about 40 percent of current capacity is being employed. This indicates two million ton miles of freight daily. On the basis of five tons per load this would be 400,000 revenue plane miles per day.

Top: First air express shipment left Mitchel Field, L. I., on Nov. 14, 1919, on a 4-engined Handley-Page bomber on a projected non-stop flight to Chicago. Headwinds used up the gas and the plane was forced down in Pennsylvania but the air express went forward by the next train.

Above: Aluminum-magnesium alloy roller-type loaders speed movement of air express packages from truck to plane.

Women's dresses are flown across the country on garment manufacturers' hangers without packaging on this Slick Airways plane.

With a large amount of excess capacity available and with vigorous young men out selling it is not surprising that airfreight rates are falling. Something very like an old fashioned price war now is in progress. Rates range from 10 to 40 cents per ton mile with the weighted average near the lower figure—possibly as low as 12.5-15 cents per ton mile. At 12.5 cents per ton mile, California fruits can be laid down in New York within 24 hours at a freight cost of 26 cents per pound. Texas strawberries cost 20 cents per pound air freight in New York.

Clothing manufactured in New York is being shipped by air to California as return cargo at $14 per hundred pounds with delivery at Los Angeles within 24 hours. Railway express cost is $13 per hundred with delivery within 7 to 10 days and rail freight $3.35 per hundred in carload lots but delivery time is three to four weeks.

The excess margin over railway express is being reduced by packaging elimination. Freight lines are loading men's and women's clothing onto planes on hangers without boxing. This reduces both tonnage costs and packaging costs.

In the case of flowers it has been found that buds can be baled with wire and shipped without elaborate packaging. Lobsters from Maine arrive at Chicago alive. Precooled fish wrapped in wax paper moves without refrigeration.

Air freight service is coming to be used extensively by mail order houses with branch stores and catalog offices. Sears Roebuck and Montgomery Ward compete with local merchants on deliveries and yet operate with small stocks by using air freight.

Impact of the new independent air freight industry on the oil industry is clear if the estimate of 400,000 plane miles per day is accepted. A C-47 plane, for example, will burn about 90 gallons per hour of aviation gasoline and consume two gallons per hour of lubricating oil. Based on 15-cent gasoline and 56-cent lubricating oil the petroleum industry has a $14.62 per hour per plane interest in the lusty infant industry.

Scheduled air lines were beginning to solicit air freight business even before the G.I.'s invaded the field. The big airlines were short of planes because of the war and due to their size not as active on their feet as the young men just out of uniform. Also they patently could not operate with such a flexible rate structure.

The air express business of course has been growing steadily and rapidly since the service first was offered in 1927. In 1928, the first full year the Railway Express Agency handled 17,000 air express shipments weighing a total of 60,000 pounds. In 1940 the number of shipments had exceeded a million and last year totalled 2,146,650 with an aggregate weight of 40,126,755 pounds. In the first quarter of 1946 air express business was up 13 percent over the same period last year.

The average air express package weighed 10 pounds in 1941 and was up to 18 pounds in 1945. Average haul has always been about 1,000 miles. Growth of the service is indicated by the accompanying table showing number of parcels handled, weight and gross revenue.

	No. of Shipments	Weight (Lbs)	Gross Revenue
1928	17,006		$ 130,773
1933	68,683	404,640	217,966
1938	715,410	4,726,567	1,919,874
1939	870,806	5,850,569	2,385,142
1940	1,078,189	7,699,772	3,043,231
1941	1,306,629	11,240,204	4,277,069
1942	1,405,320	21,704,323	9,036,380
1943	1,543,729	30,715,912	10,999,095
1944	1,773,823	34,276,834	11,451,165
1945	2,146,650	40,126,755	13,496,529

Air express service by the Railway Express agency is more comprehensive than can be offered by the independent freight carriers. The agency has 77,000 employees and 23,000 offices in the United States to feed business to the airport cities. It has 16,000 vehicles to pick up packages from home or factory. Average distance from large city center to airport is eight miles involving two truck hauls. Railway Express Agency finds that 20 percent of its air express shipments are carried at least part of the way by train. Bad weather sometimes puts air express on the rails but more often shipments are consigned to destinations away from the 375 airport cities on the 66,000 miles of scheduled airways and so must use the rails for part of the haul.

Air express rates were reduced 22 percent in June 1943 and another 13 percent on January 1, 1946. Present rates are 60 cents per ton mile for general express although commodity rates have been established at much lower figures than base rates. Newspapers and magazines have a 36-cent per ton mile rate. Flowers from the Pacific coast enjoy a similar cut of 40 percent from base rates. Lowest rate is 26.5 cents per ton mile on seafood from north Pacific points.

Railway Express Agency is seeking to extend its service to more communities. Recently it contracted for feeder service with Columbia Airlines, a small intra-state line operating between Hagerstown and Baltimore, Md.

All American Aviation has been successful in Pennsylvania and adjoining states picking up cargo from fields without landing. Parachute delivery is being experimented with and the helicopter is being given serious consideration for gathering express from small communities without airports.

OIL COMPANIES AID AIRPORT DEVELOPMENT

THE recently adopted Federal Airport Act provides 500 million dollars for the improvement and construction of airports throughout the United States. Through this expenditure, supplemented by local funds, it is expected that the United States within the next seven years, will possess 2,500 new flying fields.

The multiplication of local and regional air lines, the development of private aviation and the organization of flying clubs among men who gained some familiarity with airplane operation while engaged in military service combine to increase the demand for landing fields of modest size and equipment while the rapid growth of air travel and goods transport make necessary repeated enlargement of air fields serving long distance lines.

Unquestionably, the experiences of the war period have given a big boost to air travel and to the private operation of planes for business or pleasure. As a result practically every urban community in the United States, including even small villages, has had to consider the provision of airfield facilities of some kind and to answer the questions arising in this connection. Should our town construct an airport? Where should it be located? How big should it be and what equipment should it possess? And what are the economic possibilities involved?

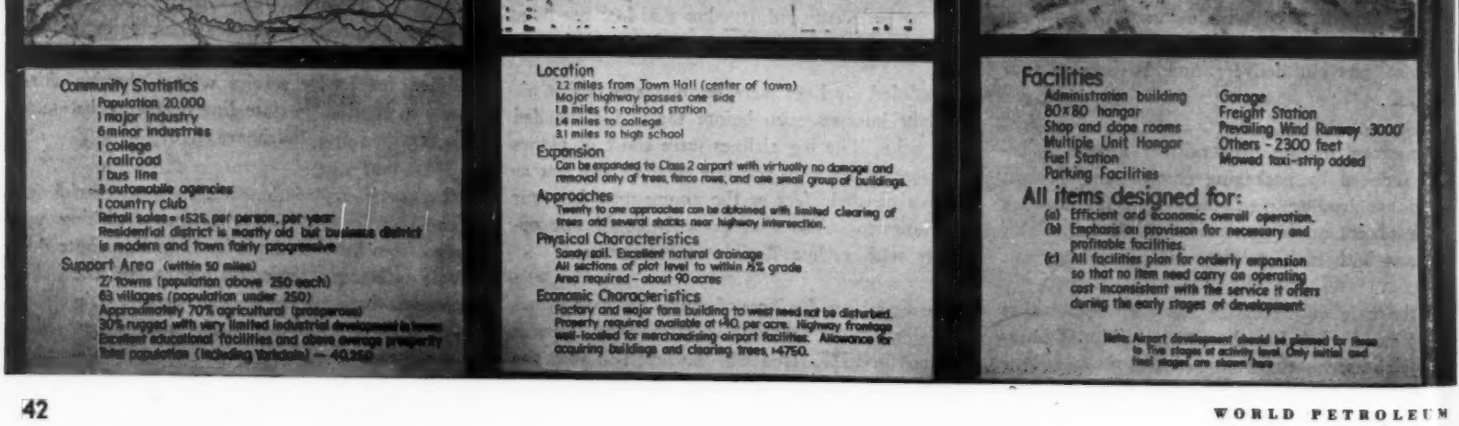
Oil companies have a natural interest in aiding the solution of these problems. Airplanes are users of high octane gasoline and lubricants and while their present requirements are only about one percent of the total consumption by land vehicles they are increasing rapidly and are expected to double by 1950 and to follow a sharply ascending curve for many years thereafter. Consequently, many companies, particularly those with large marketing organizations, have set up special divisions to aid communities and groups in determining the feasibility of constructing airports and in planning the features to be incorporated. Engineering and architectural drawings, maps, photographs and motion pictures are some of the features employed in this work. For example, Socony-Vacuum Oil Company utilizes a film entitled "Ceiling Unlimited" and a series of illuminated charts to convey salient facts about the growth of aviation and the factors governing the selection and equipment of airports.

The picture illustrates the advantages to be gained by a community placing itself on modern routes of air travel. It points out that the towns that survived and flourished in the past were those located on ocean, river and railroad terminals and main highway routes. Today that is not enough. The progressive community must also think in terms of air transportation. As the firm emphasizes, present aviation facilities in the United States are sadly inadequate. In 1930 there were 9,500 private planes, 15,000 pilots and 3,000 airports; in 1940 there were 18,000 private planes, 41,000 pilots, and the number of airports had remained at 3,000; in 1941 there were 25,000 private planes and 80,000 pilots, but the number of airports to serve them had remained at 3,000. Aside from the anticipated increase in flying, many new airports, are needed.

In talking to interested groups, the company's representatives make use of six charts to explain: (1) the analysis of the airport area, (2) the selection and analysis of site, (3) the initial stage of airport development, (4) details of buildings, (5) airport income and (6) final stage of airport development. A "Plan for the Airport Petroleum Marketer," designed for the dealer, is a program intended to improve the airport operator's business methods. The dealer program makes use of two manuals, "Ceiling Unlimited," and "Airport Program Work Manual."

"Ceiling Unlimited" presents the company's plans for the petroleum marketer. It gives the company's predictions on the private flying market, citing a study of the Department of Economics to show that this market should increase 212 percent in the next several years. The Airport Program Work Manual presents the dealer with the company's plan to assist him in making his business a profitable enterprise. It covers such subjects as airport planning, service station design, engineering and lubrication service, time saving equipment and sales promotion. The purpose of the whole program is to give practical information to those who are interested in airport construction and operation and to those who may engage in servicing the needs of individual or commercial plane operators.

Examples of the charts used to illustrate essential steps in development of new airports.


ANALYSIS OF AIRPORT AREA
SELECTION & ANALYSIS OF SITE
FINAL STAGE OF AIRPORT DEVELOPMENT
Community Statistics
Population 20,000
1 major industry
6 minor industries
1 college
1 railroad
1 bus line
3 automobile agencies
1 country club
Retail sales = $535 per person, per year
Residential district is mostly old but business district is modern and town fairly progressive
Support Area (within 50 miles)
27 towns (population above 250 each)
63 villages (population under 250)
Approximately 70% agricultural (prosperous)
30% rugged with very limited industrial development in town
Excellent educational facilities and above average prosperity
Total population (including Yorktown) — 40,250
Location
2.2 miles from Town Hall (center of town)
Major highway passes one side
1.8 miles to railroad station
1.4 miles to college
3.1 miles to high school
Expansion
Can be expanded to Class 2 airport with virtually no damage and removal only of trees, fence rows, and one small group of buildings.
Approaches
Twenty to one approaches can be obtained with limited clearing of trees and several shacks near highway intersection.
Physical Characteristics
Sandy soil. Excellent natural drainage
All sections of plot level to within 2% grade
Area required — about 90 acres
Economic Characteristics
Factory and major farm building to west need not be disturbed.
Property required available at $40 per acre. Highway frontage well-located for merchandising airport facilities. Allowance for acquiring buildings and clearing trees, $4750.
Facilities
Administration building
80×80 hangar
Shop and dope rooms
Multiple Unit Hangar
Fuel Station
Parking Facilities
Garage
Freight Station
Prevailing Wind Runway 3000'
Others - 2300 feet
Mowed taxi-strip added
All items designed for:
(a) Efficient and economic overall operation.
(b) Emphasis on provision for necessary and profitable facilities.
(c) All facilities plan for orderly expansion so that no item need carry an operating cost inconsistent with the service it offers during the early stages of development.
Note: Airport development should be planned for three to five stages of activity level. Only initial and final stages are shown here

AIRPLANE FINDS READY INDUSTRIAL ACCEPTANCE IN BRITAIN

BY R. H. WARRING

A STUDY of the current British Civil Aircraft Register reveals that a goodly number of large industrial firms are using or intend to use the airplane for business purposes. While it is more economical for some of the smaller concerns to make use of the several charter companies, others, appreciating the distinct advantages of having their own air transportation facilities, have placed orders for the necessary machines with the aircraft industry. Deliveries of new aircraft are extremely slow on account of government insistence that a very large percentage of all production be for export. It will be sometime, therefore, before private airplanes can be brought into business use to anything like the extent projected.

Of the various types available in Britain, that is, aircraft which have passed beyond the prototype and development stage and are in production, it is interesting to note two distinct freighter types. The Bristol 170 is a large machine designed specifically for economic operation. It is an all-metal high wing monoplane powered by two Bristol Hercules 131 motors of 1,650 h.p. each. Span is 98 feet and length 68 feet. Maximum loaded weight is 35,000 lbs. with a disposable load of 13,870 lbs. which gives a payload of 9,330 lbs. with full tanks. Cruising speed is 180 m.p.h. while landing and take-off runs to clear a 50 ft. obstacle are both a little over 600 yards.

Maintenance cost is given as one man hour-hour maintenance per aircraft-hour and operating cost around £20 sterling per hour. For freightage, the cost per ton-mile varies between 8d and one shilling, depending upon the cargo-load factor. The passenger version of this remarkable aircraft shows an operating cost of 1¼d per passenger-mile, with full capacity of 32 seats.

The large slabsided fuselage gives a high volumetric capacity and for ease of loading the nose has two large, sideways-opening doors, this in addition to a large side door behind the wings. Strengthening strips are fitted along the floor to take vehicles and a travelling crane attached to the roof is standard on the freighter.

In round figures, the capacity load is 4½ (English) tons and the volumetric capacity 2,400 cubic feet. Primarily designed as a merchant air carrier, this particular type has already been ordered in quantity including fifteen alone for Argentina.

The other British freighter is a small aircraft by comparison, but one which is so versatile as to be of great interest. This is the Miles M.57 Aerovan, mainly of wood construction, powered by two Blackburn Cirrus Major III motors. Its layout is unconventional, with large pod-type fuselage for maximum volumetric capacity and the tail group carried on a slender boom protruding from the fuselage roof. The fuselage is literally a well-proportioned container with a capacity of 530 cubic feet and maximum load capacity of one English ton (2,240 pounds). Range with this load is 450 miles at a cruising speed of 110-115 miles per hour and a cost of approximately 30 shillings per 100 miles for fuel and oil alone.

While these two aircraft are primarily freighters, the de Havilland Dragon Rapide is, by contrast, a machine which already has made a name for itself. Yet the Rapide has probably carried as much freight as any single British aircraft type. The Anglo-Iranian Oil Company, Ltd. has at least three Dragon-Rapides in its fleet, stationed at Abadan, and another new de Havilland design, the Dove.

The Dove is twin-engined, all-metal, low wing monoplane of post-war design with a retractable tricycle undercarriage. It has a loaded weight of only 8,000 lbs. and a normal payload of approximately one English ton. Six, eight and ten passenger versions are available and the type would appear will suited for a travelling "conference room."

As a small aircraft for individual use, the Percival Proctor is much favored. The majority of deliveries have gone to private airlines but many British and overseas companies have placed orders for it. It has a span of just under 40 feet but the wings can be folded to reduce the parking span to 16 ft. 4 in. Power unit is one Gipsy Queen motor of 210 h.p., giving an optimum cruising speed of 135 m.p.h. Normal range is 500 miles, but additional tankage can be provided at the expense of payload to increase this to 780 miles. Two or three passengers can be carried in addition to the pilot, with approximately 100 lbs. of luggage. Other variants can be supplied in which the rear seats are removable, when goods weighing 645 lbs. can be carried.

The Auster Aristocrat, a development of the wartime Taylorcraft Auster, is another popular lightplane. The original Auster was the American Taylorcraft Lightplane built under license in England. It was subsequently re-designed by the British firm and saw much service during the war years as a communications and light liaison machine. Now it has been "demobbed" and reissued in civilian guise and is probably the nearest approach yet in this country to the inexpensive airplane for the air-salesman.

Since so many new types are gradually coming through to various owners and space does not permit further descriptions, it is probably best to tabulate some of the leading particulars of the various civil aircraft, in table.

Of small lightplanes the Auster Aristocrat and Percival Proctor have been described briefly. There are also a number of new aircraft in this class, such as the Miles M.28, the Miles Messenger and others.

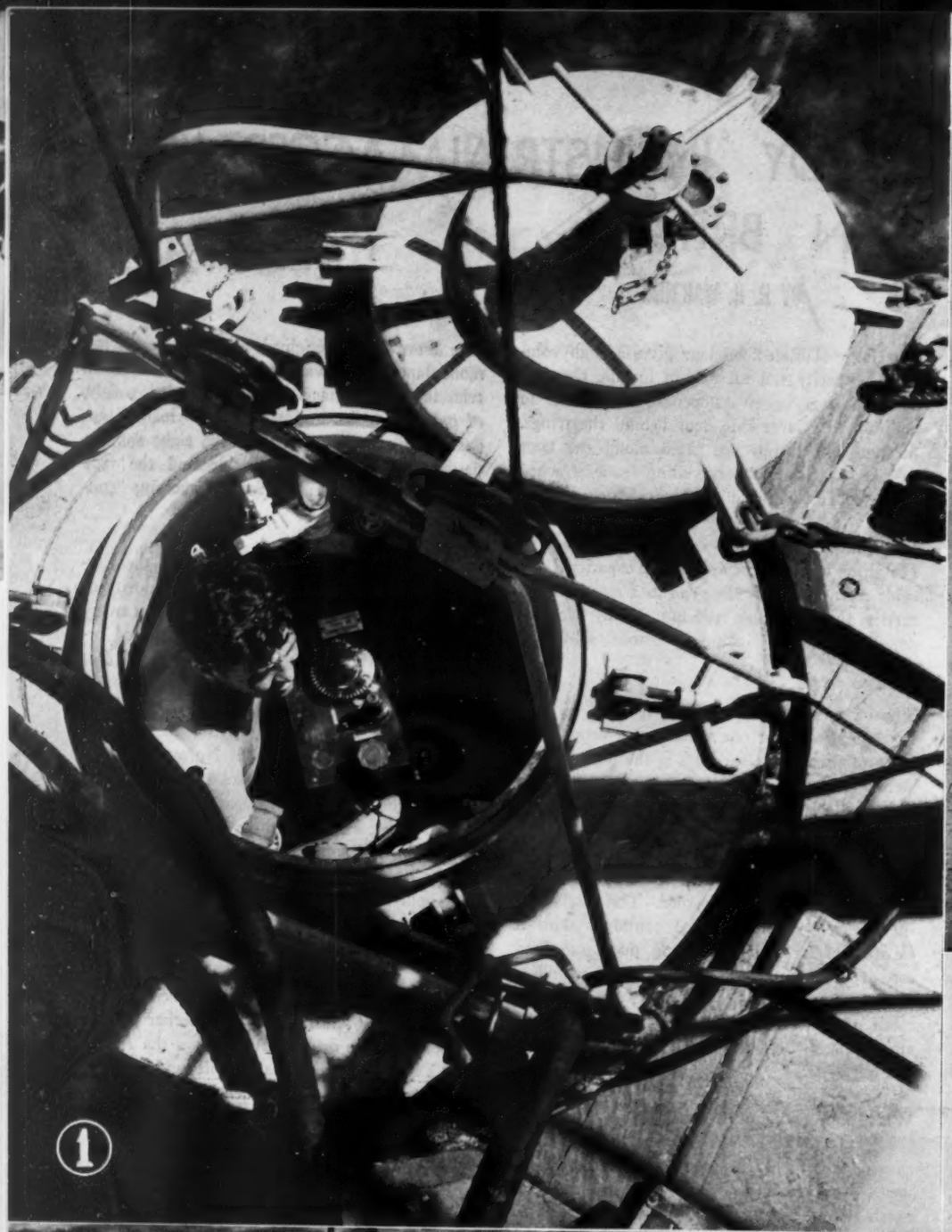
Although supply is lagging far behind demand, the airplane has made such a definite mark as an ancillary to industrial organization that civilian air transport is threatening to outstrip the organization and development of ground control and landing fields.

FREIGHTERS

	Span Ft.	Weight Lbs.	Payload Lbs.	Features
Bristol	98	36,500	8-10,000	Large utility freighter
Miles Aerovan	50	5,800	2,000	Small utility freighter
G. A. Hamilcar	110		7,000 (solo) 21,500 (tow)	Powered version of Hamilcar glider — for solo operation or towed flight — 1,440 cu. ft. freight capacity.

SMALL AIR LINERS

	Span Ft.	All-up Wt.	Passengers	Features
D. H. Dove	57	8,000	8	500 mile range at 160 m.p.h.
D. H. Dragon-Rapide	48	5,750	6-10	Biplane design—500 mile range at 130 m.p.h.
Percival Merganser	48	6,500	5- 8	Load capacity 595 cu. ft.; 830 miles range at 170 m.p.h.
Miles Marathon	65	16,000	18	Four-engined liner; 1,000 miles range with 13 passengers.
Aerocar	42	4,000	2- 5	Light transport in several models; range 1,000 miles.



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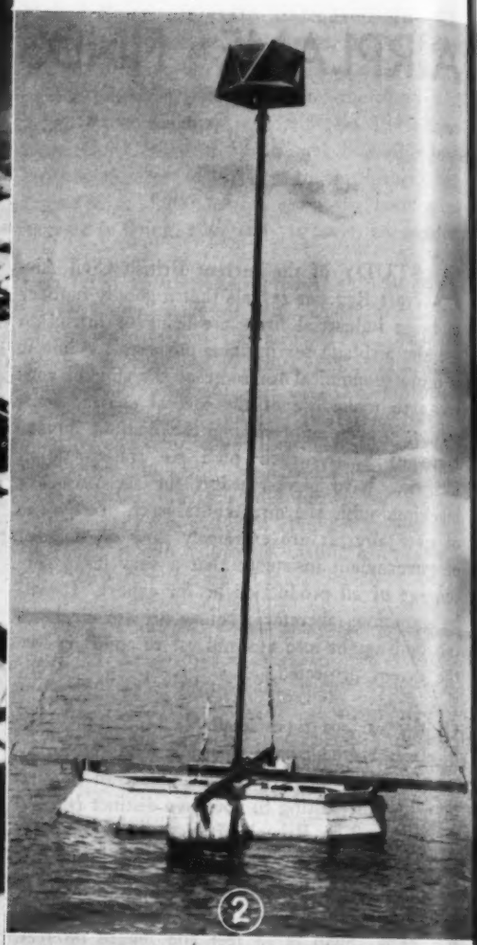

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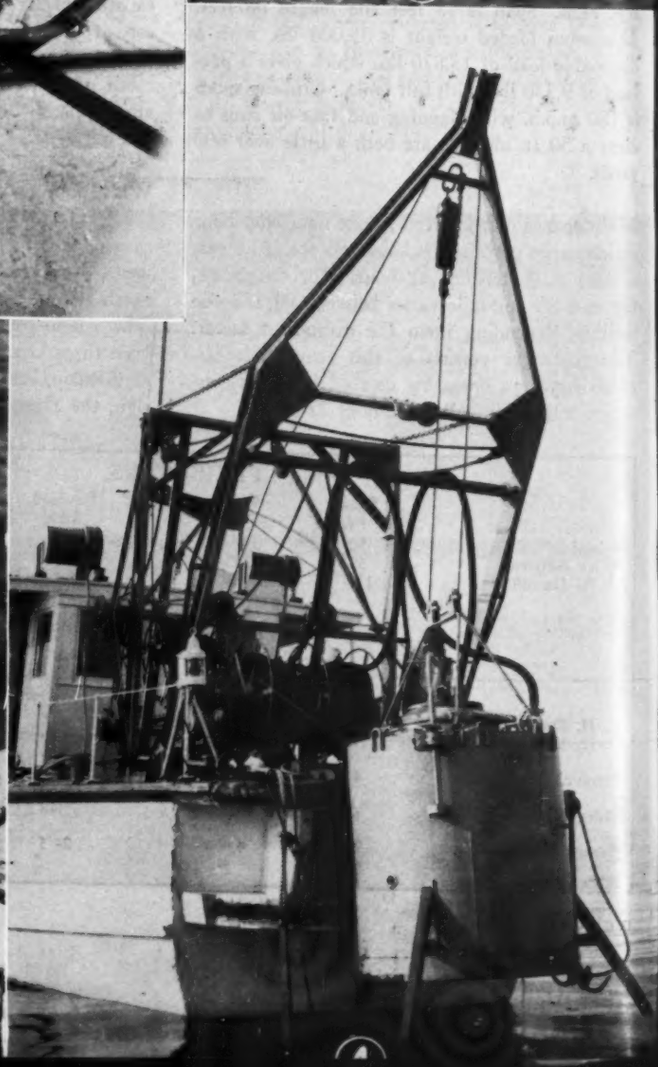


4

Grumman amphibian fitted by Gulf for magnetic exploration work in the Bahamas. Airborne magnetometer below wing is trailed beneath plane by a cable when in operation.

SEVEN GROUPS TO SEARCH BAHAMAS FOR PETROLEUM

Map of Bahamas in which submerged areas are being studied.

DISCOVERY of oil in Florida and Cuba has centered attention on the possibilities of developing production in the Bahamas. This British colony consists of a chain of islands, cays and reefs 760 miles in length extending from the vicinity of Palm Beach, Florida, to the vicinity of Haiti.

Total land area in the archipelago first discovered by Columbus, is approximately 4,400 square miles or roughly the size of Jamaica, the largest island in the British West Indies. More important than the land area, perhaps, is the vast area of shallow submerged banks varying from a few feet to 20 feet in depth. This submerged area comprises about 50,000 square miles.

In recent months concessions for exploration have been granted to seven groups of which four are British and three American. Largest concession has been awarded to Anglo Bahamian Oil Co., Ltd., newly created subsidary of Anglo-Iranian Oil Co. This concession covers 12,925 square miles.

Trinidad Leaseholds and South African Mining interests have organized British Bahamas Oil Development, Ltd., to prospect a concession of 6,439 square miles. Shell interests have a 5,392-

square-mile concession. The Christie Syndicate has a concession to explore 1,502 square miles and the Bahamas Mining Co., Ltd. has a concession covering 560 square miles of land area and adjacent submerged land to a depth of ten fathoms which is estimated to increase the total area of the concession to about 625 square miles.

The three American companies which have been granted concessions include Standard Oil Co. (Bahamas) Ltd., a subsidiary of Standard Oil Co. (N. J.); Bahamas Oil Co., Ltd., a subsidiary of Superior Oil Corporation and Bahamian Exploration Co., Ltd., subsidiary of Gulf Oil Corporation.

The Jersey company has a concession covering 8,474 square miles, Superior 8,996 square miles and Gulf 3,676 square miles. American concessions total 21,146 square miles and British concessions 21,491 square miles.

Exploration of the Bahama islands themselves will present no difficulties since the islands all are low and flat with wide beaches of white and pink coral sand. The greatest elevation in the group is 400 feet on Cat Island. When it comes to the submerged areas geologists and geophysicists are developing new techniques. Anglo Bahamian has obtained Landing Craft 492 from the British navy for use as a headquarters ship and is developing a new type of observation platform for taking gravity measurements.

Superior's exploration operations also involve a fleet of small vessels and Gulf is using a flying boat and the air borne magnetometer for at least part of its geophysical exploration work.

The diving chamber is a key instrument in the Standard of New Jersey exploration work, centered off Great Bahama Island in shallow waters mostly less than 20 feet deep. Photograph 1 reproduced on the opposite page shows the open top of a specially designed 6-foot diving chamber with operator and magnetometer ready for submersion in the brilliant blue Bahamian waters. Photograph 3 shows Dr. R. J. Watson of Tulsa, manager of the Jersey exploration group emerging from the chamber. At the left is C. F. Sellers who is in charge of the diving chamber and underwater gravity work and at the right is J. Pollard of the exploring group.

The diving chamber is cylindrical in shape, about six feet high, and weighs approximately 4,000 pounds. It is equipped with safety devices, a safety hatch and a compressed air blower which can be used to free the chamber if it becomes stuck in the mud. The operator in the chamber is in constant telephone communication with his crew aboard ship.

The air inside the diving chamber is kept at atmospheric pressure, supplied through one of two large diameter hose lines. One hose forces air into the bell and another takes it out, keeping constant circulation. A huge winch aboard the control boat raises and lowers the diving bell and its human cargo, on a stout cable.

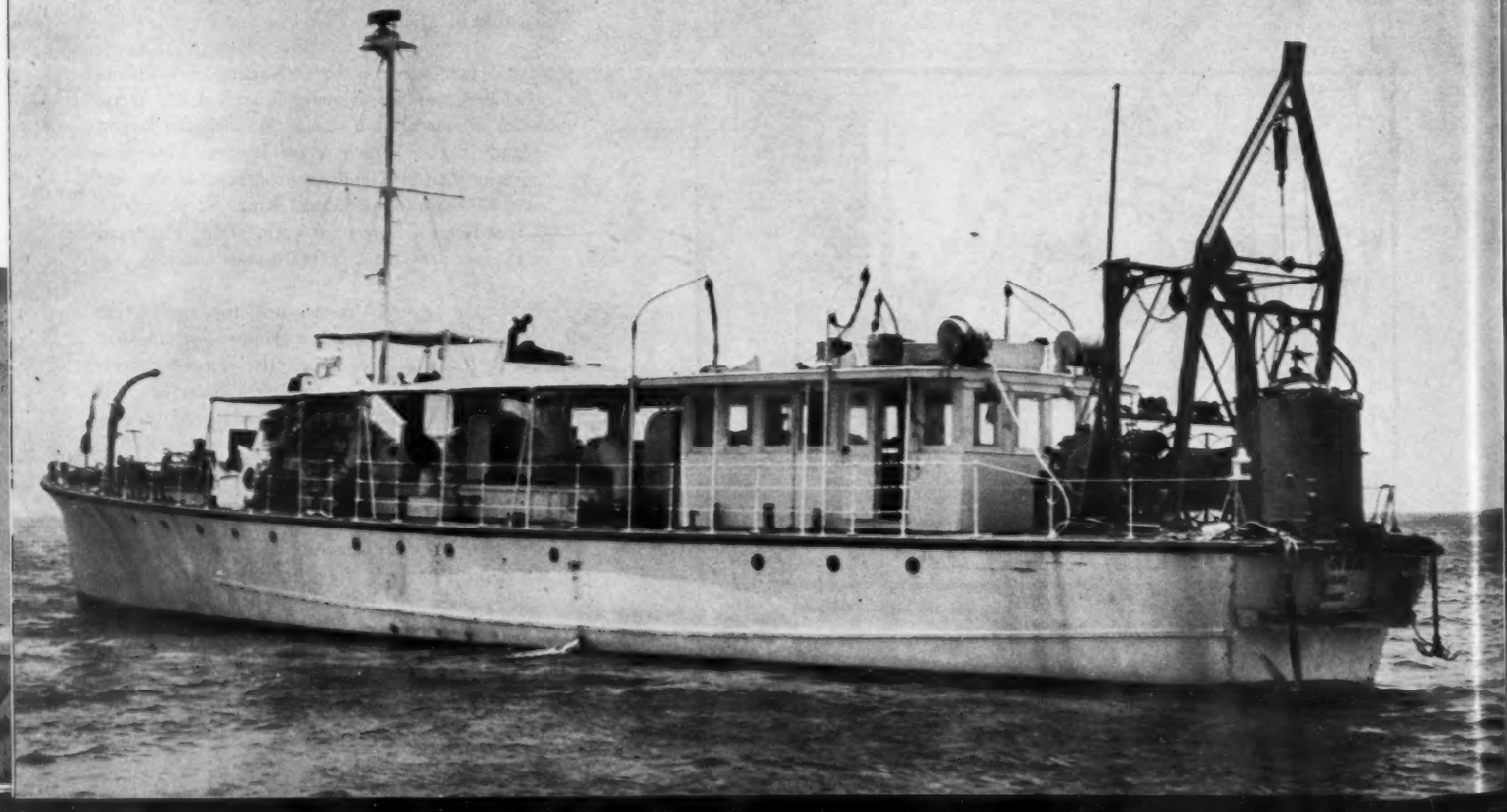
The time necessary for descent, ascent and making a gravity meter reading will average about 15 minutes. However, additional time is necessary to anchor the boat, set up a reading station and then retrieve anchor after the reading has been completed. About 50 readings a week are anticipated in the submarine search for petroleum.

Photograph 4 shows the diving chamber suspended from the stern of the Stanba which re-recently was engaged by the Canadian Navy in searching for submarines. The Stanba is the first ship to use radar in the search for oil. Photograph 2 shows a radar target of which several have been set up by the New Jersey company explorers. At the top of 25-foot masts are radar arrays which may be picked up from as far as 18 miles on the radar screen of the Stanba in order to enable the navigator to determine his exact position.

In their exploratory work the New Jersey company geophysicists live on the 112-foot Stanba for periods of six weeks. They then return to the island camp for rest and recreation. There are 20 men in the ship's crew and exploratory party. A supply ship shuttles between West End Island and the Stanba.

Part of the area to be explored is in very shallow water. To enable the geophysicists to map the ocean floor in this ultra-shallow territory a 22-foot shallow-draft boat has been equipped with an airplane motor and rudder. With this equipment the small boat can operate in less than 6 inches of water.

The 112-foot Stanba with diving chamber and launching gear at stern.



BRITISH OIL COMPANY EARNINGS SHOW RECOVERY

BY ALEC H. DAY

OPERATIONS of British oil companies were more profitable last year than in 1944, but the largest undertakings, and some smaller concerns, have a lot of leeway to make up before the pre-war level of earnings is regained.

Companies financed by British capital operate in widely separated areas of the world. Some are mainly producers, others are producers and refiners, and a few are completely integrated units. Having regard to these differences, the trend of net earnings in 1945 showed a remarkable similarity as between one company and another practically all reporting a small-to-moderate expansion of profits for distribution.

The end of the war found all British companies under the influence of the drive for increased production, the effect of which continued up to the end of the year. This offset the rising tendency of costs, although there was little apparent change in marketing conditions as against 1944. British taxation would in any event have acted as a stabilizing influence on net earnings, preventing any big increase in amounts available for stockholders.

Profits of ten representative companies summarized in the accompanying table totalled £13,972,914 in 1945, an increase of 10.6 percent against the previous year, but dividends were generally unchanged. Exceptions were Shell Transport and Venezuelan Oil Concessions, which made slightly larger payments, and United British of Trinidad, which maintained its rate but paid the dividend free of income tax. Net earnings of the majority of companies left substantial margins beyond the sums distributed in dividends, thus permitting large allocations to reserve funds. Cautious dividend policies may have been adopted partly as a reaction to war experience, but a more important factor making for conservatism was the current need for heavy capital expenditure.

War-time policy of the British authorities, under the coalition government, was highly successful in "taking the profit out of war" for the oil industry. The war period for most companies involved intense activity without any commensurate return on their capital. In response to the call for increased output to give the maximum supply of oil products to the Allied forces, there was a general move to stretch production to the utmost and to concentrate operations on each company's most productive areas. Often, as in some Trinidad fields, output was forced beyond the limits of economic production.

The policy was carried in some areas to a length that risked permanently impairing future productivity, but heavy production produced no corresponding rise in distributable earnings. Government marketing arrangements and high taxation apparently skimmed off any appreciable profit accretion. Although some relief has been given from excess profits tax on account of undue depletion of oil reserves, there is still some justification for the complaint of several companies that they have been taxed on a profit basis for what is essentially a dissipation of capital resources.

Capital assets as well as profits were adversely affected by war conditions. Companies owning producing and refining interests in the East sustained severe damage either in the course of military operations or as a result of "scorched earth" destruction. Burmah Oil, which lost the whole of its fields and refineries in Burmah, has so far made no announcement as to the extent of government compensation. The company relied mainly for revenue during the later war years on dividends from its large holdings of Shell Transport and Anglo-Iranian.

Shell Transport also lost heavily through destruction of Royal Dutch-Shell properties in the Netherlands East Indies and elsewhere. Anglo-Iranian operations in Persia escaped direct war damage, but were subjected in the earlier war years to a severe curtailment owing to the adverse military situation in the Mediterranian area and the need of economizing tanker space. Both Shell and Anglo-Iranian suffered the temporary loss of their distributing organizations in many European countries. British concerns operating in Romania had their refineries heavily bombed and worked under extremely difficult conditions, which have been worsened by Russian influence since the end of the war.

Severe losses had to be taken by companies owning tanker fleets. These are now in course of replacement, but both capital expenditures and immediate profit-earning capacity are involved.

From one cause or another, British companies have been left with many post-war problems to face. New exploratory campaigns have to be undertaken to make good the inevitable war-time neglect of normal programs. Properties damaged or destroyed have to be restored, and plant maintenance and renewal arrears overtaken. These and similar measures are additional to any plant adjustments and extensions required owing to changed demands for oil products. They will have to be financed at a period of high prices and must involve heavy capital expenditure.

A few companies, including Anglo-Egyptian, are expecting to raise fresh capital for development and reconstruction when their future outlays can be estimated more closely, but the majority had substantial free cash resources at the beginning of the war, and have been building them up further from war-time profits.

Demand for oil products during 1946 has been heavier than anticipated, and many British concerns will benefit during the second half of this year from the rise in Gulf Coast prices. These factors should offset the higher costs of production and distribution and leave 1946 profits at least up to 1945 standards.

Nevertheless, uncertainty on the extent of future capital expenditure is bound to affect dividend policy. It may well prevent any general rise in dividend rates in the immediate future, whatever may be the course of earnings.

	1945		1944		1939		1938	
	Net Profit £	Div. %	Net Profit £	Div. %	Net Profit £	Div. %	Net Profit £	Div. %
Anglo-Ecuadorian*	184,461	7½	184,393	7½	171,778	10	265.712	10
Anglo-Egyptian	143,289 (a)	12½	142,819 (a)	12½	223,941	12½	238,993	12½
Anglo-Iranian	5,792,447	20	5,677,142	20	2,986,393	5	6,109,477	20
Apex (Trinidad)**	203,681	30	193,516	30	175,585	30	250.814	40
Burmah	3,044.192	12½	2,728,484	12½	3,433,915	21	3.849.551	21
Shell Transport	2,205,229	6¼ (b)	1,944,922	5 (b)	2,077,844	5 (b)	6,230,590	20 (b)
Trinidad Leaseholds*	524,769	15	445,690	15	270,464	15	573.471	27½
Trinidad Petroleum Development***	262,612 (c)	15	232,340 (c)	15	179,453 (c)	15	182,357	12
United British of Trinidad	143,912	8¾ (b)	141,326	8¾	134,303	8¾	83,335	nil
Venezuelan Oil Concessions	1,468,322 (a)	20⅝	938,329 (a)	18¾	1,281,984	16⅞	1,482,829	16⅞

*Year ends June 30th. **Year ends September 30th. ***Year ends July 31st. (a) After charging gross income-tax, including tax recoverable from dividends. (b) Tax-free. (c) Profit struck before tax provision.

LPG MAKES RAPID PROGRESS IN FIRST POST-WAR YEAR

BY G. L. BRENNAN*

AT the end of hostilities in August 1945 the Liquefied Petroleum Gas industry was given the opportunity for the first time since the beginning of the war to expand its production, distribution and marketing facilities. In spite of equipment and appliance shortages it has expanded rapidly during the past twelve months. At present it is faced with three serious problems involving transportation and appliance manufacture and shortages of fuel supplies in certain areas during the coming winter.

The greatest increases in the number of new users have been in the domestic and utility fields. At the end of 1941 it was estimated that there were approximately 2,125,000 household users of propane and butane throughout the United States, and that from 300,000 to 400,000 additional installations were made during the war for reasons considered essential by government control agencies. During the calendar year 1946 new domestic users will probably number close to 1,000,000 which would indicate by the end of the year a total of over 3,500,000 American homes equipped to use liquefied petroleum gas for cooking, water heating, refrigeration and heating. There is no doubt that this increase would have been greater if equipment and appliances had been more readily available. Some types of equipment are now plentiful in supply but it appears that it will be some little time before the production of portable containers and gas consuming appliances will anywhere meet the current demand.

Large utility gas plants supplying natural or manufactured gas to their communities have had unusual demands placed upon them for the supply of fuel to industrial firms and home users for space heating in the winter season, imposing upon natural gas pipe lines and manufacturing facilities a load greater than their present capacities. Many of these utility companies are building large storage installations for use in supplementing their gas supplies this coming winter. These demands alone place upon manufacturers and suppliers a serious peak load which will be difficult to meet on account of the shortage in transportation equipment.

Utilities supplying smaller cities with manufactured gas are finding costs of coal, labor and gas oil rising rapidly and are, therefore, installing equipment to use only butane or propane to supply their communities. It is estimated that by the end of 1946 there will be well over 300 communities in the United States receiving gas through mains supplied entirely by the liquefied petroleum gas industry. Industrial gas users who, in the past, depended upon natural gas or manufactured gas for their fuel requirements are now relying to a greater extent upon liquefied petroleum gas for use in metallurgical processes.

During the war the chemical industry markedly increased its demand for liquefied petroleum gases, particularly propane for use in the manufacture of a large number of chemical products. This demand is continuing at a high rate and it is to be expected that chemical industry demands for propane will continue to grow in the future. In most cases chemical plants utilizing light hydrocarbons have been located adjacent to sources of supply such as natural gas and oil fields or near large petroleum refineries. The accompanying charts show the growth of this industry since 1938. The data is based on U. S. Bureau of Mines reports and it should be noted that volumes of butane and propane used by refineries for blending, polymerization, alkylation and fuel, butanes used for synthetic rubber and a large percentage used by chemical companies are not included.

Distributors of propane and butane immediately after the war started construction programs to increase fuel storage capacity of existing bulk plants and to install additional plants at new locations in their marketing areas in order to reduce distribution costs to the consumer. Likewise, a large number of new concerns have entered the domestic marketing field with the result that the present or prospective household user has greatly improved service facilities available. As previously stated, there has been and still exists a shortage of portable containers which are most widely used in the northern part of the United States for the distribution of propane to the domestic consumer. This shortage has limited the expansion of the so-called "bottled gas" division of the industry and has resulted in higher distribution costs, since large numbers of bottled gas users have only one container at their homes and it requires special trips by the distributor to replenish fuel supplies, as contrasted to the normal exchange made on current routes when each consumer is supplied with two containers. The supply of new portable containers has been used almost exclusively to acquire new users to the extent that appliances have been available. It is a well-known fact that shortages of cylinders and appliances have been caused to a great extent by the shortage of steel, although the supply of larger tanks used mainly in the southern states for domestic purposes, along with valves, fittings and gas regulators, are in more plentiful supply, but might possibly again become scarce if southern distributors could obtain the desired quantity of gas consuming appliances.

Very substantial progress during 1946 has been made by distributors in southern states in developing summer loads. The use of butane and propane for power generation in sawmills, cotton gins and other industrial operations, as fuel for internal combustion engines operating water pumps for irrigation, and the comparatively new application to flame cultivation account for a substantial amount of the increased summer load developed. Although liquid fuels can be used for flame cultivation, it now appear that liquefied petroleum gas has superior advantages, not only for the actual burning of the weeds, but for use in the tractor engines, particularly on large plantations growing cotton and sugar cane.

Another marked development in the south is the increasing use of propane and tanks and equipment designed for propane which may be used for either butane or propane as the supply situation may demand. The manufacture of motor gasoline requires large quantities of butanes for blending, polymerization and alkylation. During the period since the end of the war there has been a serious shortage of tetraethyl lead and many refiners have operated alkylation plants which require substantial quantities of Isobutane. Production of 100 octane aviation gasoline was drastically reduced at the end of the war, and many concerns felt that there would be an unlimited supply of butane as a result, but current experience shows that all of the light hydrocarbons formerly used in the 100 octane gasoline program are back in motor gasoline, and it is also apparent that additional demands for butanes from the refining industry will continue to create shortages during the winter months.

It was expected a year ago that the production of synthetic rubber in the United States would decline, reducing materially the demand for butanes and butylenes. Developments in the synthetic rubber industry have reversed this trend to the extent that considerably more normal butane will be used for the production of synthetic rubber over the next few months than was the case a year ago.

Propane is now being produced in adequate quantities, but the supply of propane tank cars is below requirements. At least 2,000 propane tank cars are on order with manufacturers but their production is delayed by shortage of steel. Gov-

* Manager, Liquefied Petroleum Gas Division, Warren Petroleum Corporation.

ernment agencies built and leased to industry several hundred tank cars during the war and are now withdrawing a large number of these cars for use in the synthetic rubber program and for the transportation of ammonia. Liquefied petroleum gas tank car users are endeavoring to work out a solution of these difficulties with the various government agencies involved.

The industry may look forward to future increased supplies of propane as contrasted with butane with considerable confidence unless prices paid for butane become competitive with motor gasoline values. A change in the amount of synthetic rubber production would make some butane available, but the quantities would not be significant.

Substantial amounts of propane are now left in residue gas, burned in carbon black plants or in refineries for fuel. Additional extraction equipment at existing gasoline plants can recover appreciable quantities of this propane, providing prices obtained justify the investment and operating costs involved. It should be noted that in most modern gasoline or recycling plants better than 95 percent of the butanes are now being recovered, but only about 35 to 40 percent of the propane.

Substantial quantities of butane and smaller quantities of propane were exported from the United States before the war, partly by tanker movement or in small containers shipped as deck cargo. Such exportation has been resumed, and foreign demands in many countries appear to be significant. Shortage of containers has restricted quantities exported as deck cargo and recent changes in ocean freight rates have increased the cost of these products delivered overseas. The foreign distributor faces the same problems in respect to butane as does the distributor in the United States, and the future use of propane in foreign countries will no doubt have greater development. Refinery production in some countries may make supplies of butane available for local distribution when full operation of such refineries is resumed. The supply of butane in the United States has always been in excess of demands during the spring and early summer months, and any export requirements that could be transported during these months could be adequately met in the United States at the present time. On the other hand propane supplies for export can be made available uniformly throughout the year.

The industry continues to exert widespread efforts to assure safe handling of liquefied petroleum gas, to cooperate with national and state regulatory bodies in the preparation of satisfactory standards, and to continue safety programs with their organizations, to perfect equipment and improve operating practices so as to continue to minimize the hazards involved. During the current year there have been a number of new state trade associations formed that indicate an awakened interest in the industry's problems particularly those concerned with safety.

Developments in the liquefied petroleum gas industry since the end of the war may be summarized as follows:

Sales of domestic fuel have expanded rapidly and are limited mainly by appliance shortage.

The utility industry will use greatly increased volumes of these products in the future.

The chemical industry continues substantial use of light hydrocarbons, particularly propane.

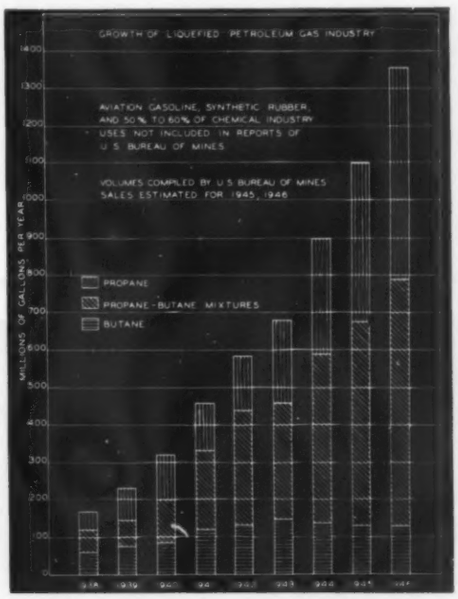
Exports to foreign companies have been resumed and may be expected to expand materially

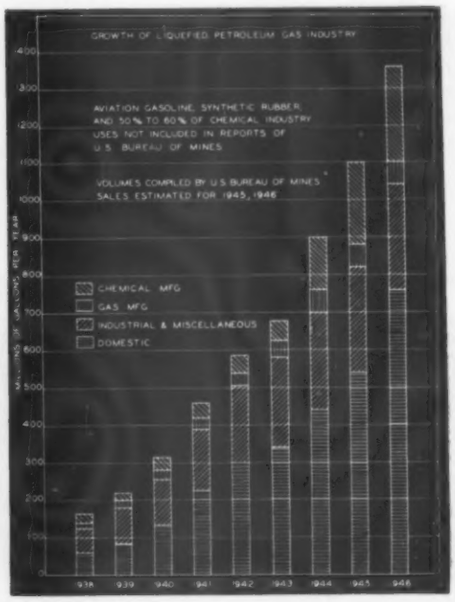
There will be an acute shortage of propane tank cars until new cars are available sometime early in 1947.

The supply of butane and butane-propane mixtures this coming winter season will probably be inadequate for the demand.

Future supplies of propane will be adequate for substantial expansion in the use of this product.

Bureau of Mines reports of total sales for 1945 are not yet available but estimates indicate that during 1946 the total increase based on the Bureau of Mines method of reporting will exceed 1,400,000,000 gallons, giving an estimated increase over 1945 of 25 to 30 percent.


GROWTH OF LIQUEFIED PETROLEUM GAS INDUSTRY
AVIATION GASOLINE, SYNTHETIC RUBBER AND 50% TO 60% OF CHEMICAL INDUSTRY USES NOT INCLUDED IN REPORTS OF U.S. BUREAU OF MINES
VOLUMES COMPILED BY U.S. BUREAU OF MINES SALES ESTIMATED FOR 1945, 1946
MILLIONS OF GALLONS PER YEAR
PROPANE
PROPANE-BUTANE MIXTURES
BUTANE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MILLIONS OF GALLONS PER YEAR
CHEMICAL MFG
GAS MFG
INDUSTRIAL & MISCELLANEOUS
DOMESTIC

Warren Petroleum Corp., Salem Plant No. 21

GULF'S NOTABLE EXPANSION AT GIRARD POINT . . . . . .

PLANNED as part of the great wartime expansion of the nation's refining facilities and started early in 1945 the giant catalytic cracking, alkylation and other units for the manufacture of high grade petroleum products erected by Gulf Refining Company at Girard Point, Philadelphia, went on stream early in the past summer.

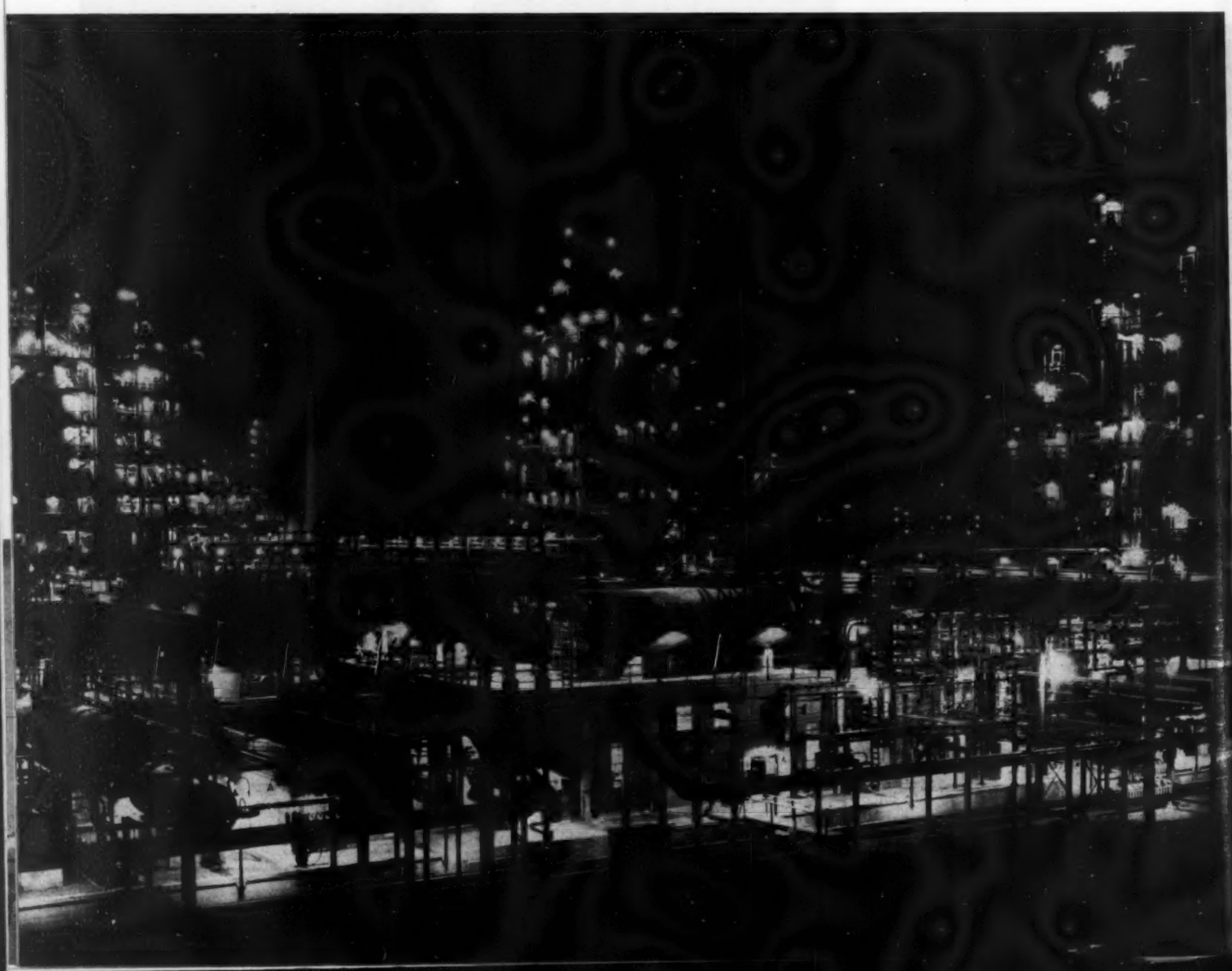
Central feature of the new installations is the catalytic cracking unit, incorporating the latest features of the Fluid catalytic cracking process. Its designed capacity is 21,000 barrels daily and to keep it fully supplied the crude throughout capacity of the refinery had to be increased, involving the installation of additional storage capacity, pipe lines and pumping equipment. Another essential element in the enlarged plant is the Atmospheric and Vacuum Topping unit with a daily capacity of 30,000 barrels. In this unit crude oil is separated into selected fractions, including straight-run gasoline, naphtha for the Polyform Unit and special gas-oil fractions which provide the bulk of the charging stock for the big cat cracker. The remaining reduced crude goes to lube stocks and heavy fuel oils.

The cracking process which takes place in the Fluid Catalytic cracking unit results in the conversion of the selected gas-oil charging stock into a high-test gasoline, vast quantities of petroleum gases, fuel oil and carbon. The latter is burned off in the process of regenerating the catalyst; the gases are compressed, recontacted with the the unstabilized distillate and charged to the unit's light-oil recovery system for separation into uncondensable gases, a butane-butylene fraction and catalytically cracked gasoline.

The butane-butylene mixture, and similar fractions from other refinery units, constitute the charging stock to the Alkylation plant, the third major unit involved in the expansion program. As a result of operations carried out in the Alkylation Union, the iso-butane and butene react chemically to form an "alkylate." This synthetic product, with very high anti-knock properties, is blended with gasoline base stock to raise its octane rating and improve its performance characteristics.

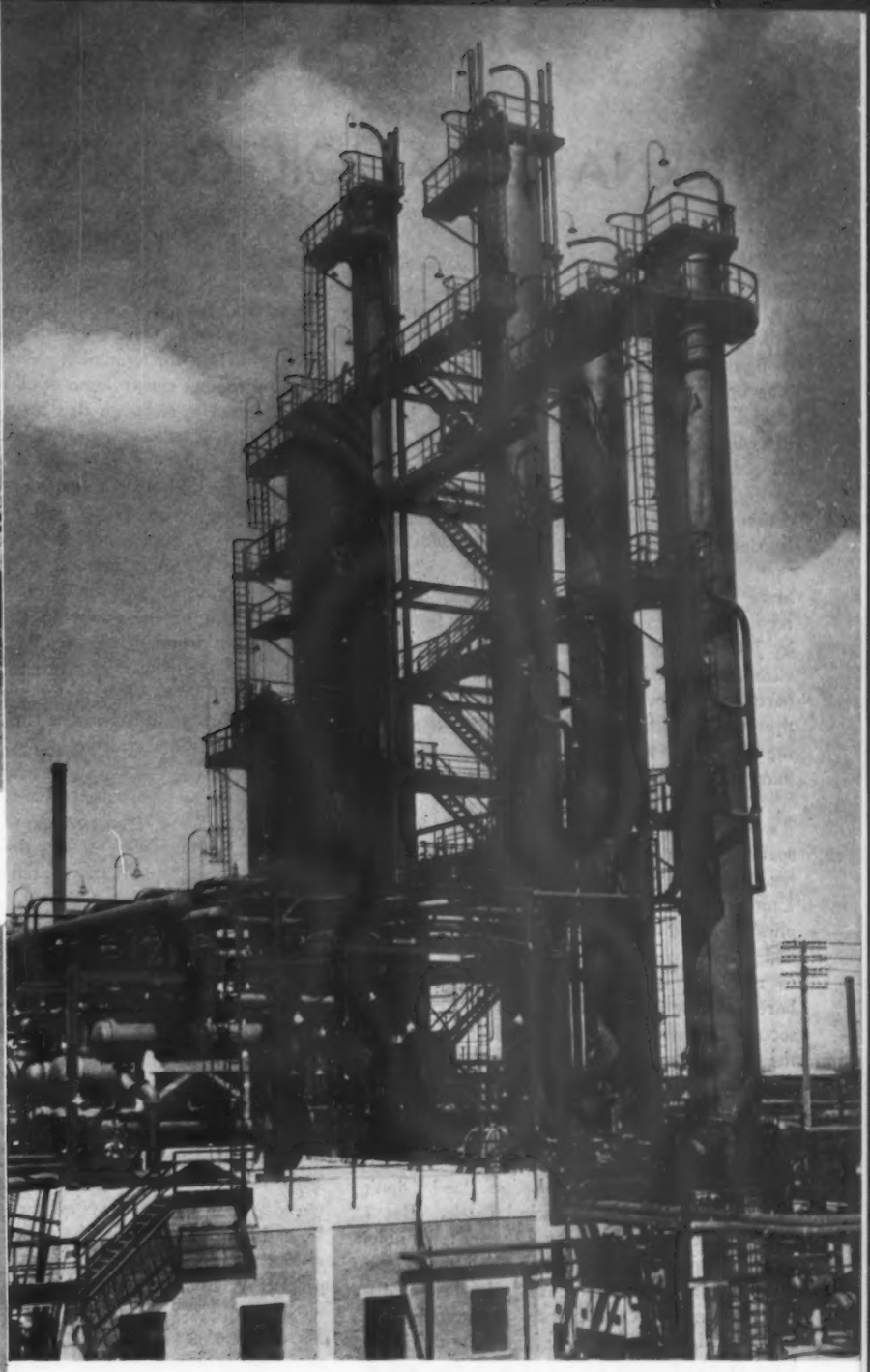
Although originally projected for the purpose of enlarging the supply of aviation fuel for military use the new installations which were entirely financed by the company were planned with an eye to the future and are so carefully balanced that when the war ended no change in the equipment was required. The facilities designed to make better fuels for war serve equally well in making better gasolines for civilian uses.

Night view of Gulf's new Girard Point plant showing fluid catalytic cracker at left, light oil recovery system in the center and alkylation unit at right.



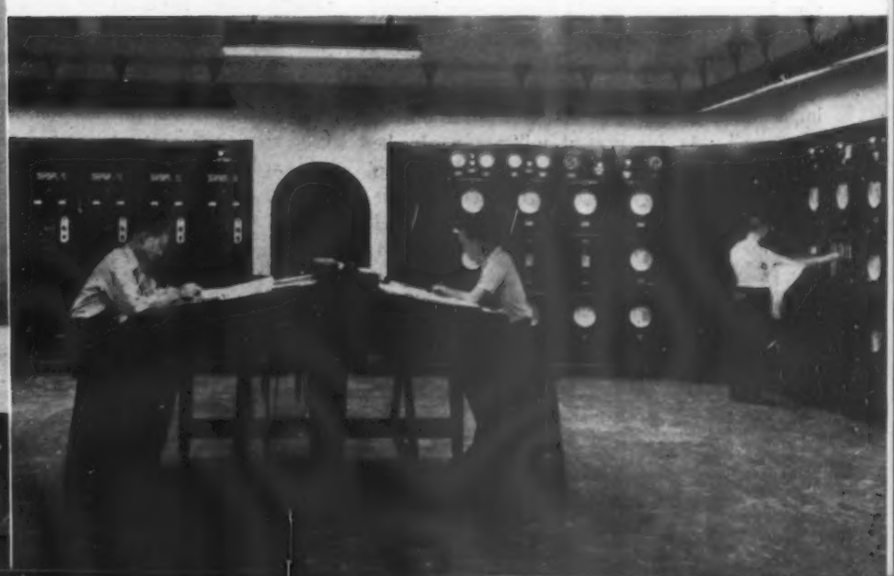
Spherical pressure tanks for light products illustrating insulated tank supports for fire protection.

30,000-barrel atmospheric and vacuum topping unit for cracking stock preparation.



Close-up of light oil recovery system in which butane-butylene fraction for alkylation is separated f cracked gasoline.

Main control room for "cat" cracker.



INTERNATIONAL OIL CONTROL STIRS WASHINGTON

W. J. MADDOX

ALTHOUGH Congress is away and the legislative mill is at a standstill, oil continues to figure prominently in Washington discussion. The upsurge in interest has been caused by renewed evidences that the administration is still determined to press for the establishment of some form of international oil control and as a preliminary step intends to push for early ratification of the Anglo-American oil treaty when the legislators assemble again.

State Department thinking on international oil regulation was revealed in a national broadcast by John A. Loftus, chief of the Petroleum Division, and Charles B. Rayner, advisor to the department on petroleum affairs. At the same time Colonel G. H. Vogel, executive officer of the Army-Navy Petroleum Board, uncovered some thoughts of the military on the subject.

Two points in the discussion over the air kindled sparks that have started a lively fire among oil men and others who reject the idea that the United States is in danger of exhausting its supplies of liquid fuels within this next few years and who distrust any sort of proposal looking to regulation of oil by an inter-governmental bureau. One was the forecast that the country soon will have to import petroleum to satisfy the domestic needs. The other was the suggestion that a world oil commission might well be empowered to regulate production and distribution internationally.

"I'm no prophet," said Mr. Loftus, "and I don't propose to get into a statistical battle. But I think it's safe to say that by 20 years from now, we shall have to import close to half the oil we consume, unless some large new oil fields are discovered, and we can't count on that." By that time, he added, "We'll be using in the neighborhood of 6½ million barrels of oil a day, and it doesn't appear now that we're likely in 1965 to be producing more than about 3½ million barrels a day, in economic competition with foreign fields." He agreed that by 1965, "if oil consumption increases as we would expect, our imports will probably be very heavy."

Middle East oil, Col. Vogel declared, is "very important logistically, as we found out during the war." As for present military needs, he said, we are getting some motor gasoline from the Persian Gulf, as well as jet fuel, and the Navy gets about half of its "Navy special" fuel from the Middle East—about 50,000 barrels a day from Bahrein and Ras Ranura.

A-NPB, Vogel told the radio audience, is constantly figuring requirements and ways of meeting them. "We're analyzing our reserves, domestic and foreign. Some of these reserves are being set aside for future use, the Alaskan Naval reserve fields, for example. We're even considering further conservation of oil reserves within this country, although that may not be easily achieved."

As to future military requirements, whether they will increase or decrease, Vogel found it "hard to say—so much depends on research and developments we can't predict. The steam turbines on Naval vessels now utilize only about eight percent of the power in the oil we use. Power units being developed may use up to 24 percent of the power. But then the question arises: Will we use less oil, or will we develop more speed so as to cancel out the saving? My guess is, we'll do the latter."

Even more controversial questions were opened up by the State Department representatives. Said Mr. Rayner: "We believe that in the near future a general international policy should be developed for the oil industry. Monopolies should be discouraged, and the way should be opened for small oil companies as well as large ones to enter the foreign field. The world's oil should be available to all nations on equal terms, without discrimination, so there will be no more 'have' and 'have not' nations with respect to oil. And last but not least, there must be some assurance that all parties concerned in developing an oil field—including the people of the country involved—will get a fair share of the proceeds." To effect this, he thought that "some sort of world-wide committee or authority under the United Nations might be the answer. It should represent the consuming nations as well as the producing nations."

First duty of such a body, he said, would be to study the international oil trade, and to be prepared to advise governments and oil companies on the types of arrangements that are most beneficial to all parties. According to Mr. Loftus, such a world oil organization might have functions that were not assigned to the Anglo-American commission. For instance, "it might review the terms of oil concessions and contracts, and suggest revisions. It might serve as a sort of appeals board or arbitral tribunal, where nations (and oil companies, too) that feel they have been subjected to discrimination could come to seek a hearing and perhaps an adjustment."

As to whether this would be purely advisory, Loftus thought: "Maybe not. This will need some thinking through on the part of the nations that will be concerned, and the American oil companies, too. You know, when we stop to think about what Colonel Vogel said earlier about the spot we are in, as far as oil is concerned, it begins to look as if the foreign activities of American oil companies are a matter of real public concern, that they're vested with the public interest, something like public utilities." Although these observations were handed out in a casual way and are not to be classed as officially binding they contain dynamite and can be counted upon to create an explosion if they ever are brought seriously before Congress for action. To many of those who have followed the proceedings of the United Nations assembly the proposition that any agency under its supervisor should have authority to revise oil concessions or to who shall get petroleum products and how much is enough to bring on the apoplectic manifestations. Maybe the remarks of the State Department men were in the nature of a trial balloon but if so there are plenty of bow-and-arrow men ready to shoot it full of holes.

In a report just published by the Brookings Institution, Dr. A. C. Millspaugh, who was Administrator General of the Finances of Iran from 1943 to 1945 and earlier from 1922 to 1927, says: "A communistic parliament or dictator at Teheran will assuredly consider the nationalization of Persia's oil resources, and another cancellation of the Anglo-Iranian Oil Company's concession on the Gulf would become a possibility." But to the British these oil fields represent a vital interest, and Dr. Millspaugh expects "in certain eventualities" a British armed intervention to protect the fields. He points out that trouble in Iran is not over; it is in the making.

In Dr. Millspaugh's opinion, American diplomacy in that area and the gestures made by the United Nations Security Council are hopelessly inadequate. According to him, the "autonomy" of Azerbaidjan will mean the virtual dismemberment of Iran.

Approval by the House Naval Affairs Committee of the request by California Standard for a "clarifying" change in its Elk Hills contract with the Navy seems assured in the light of the hearing held September 9. Not enough members were present to constitute a quorum, and the committee decided to defer action till November 18 to give Navy a chance to thoroughly study the matter and come up with a recommendation. Under the present arrangement the company is paying the cost of producing the oil it receives and the full cost of maintaining the field in a state of readiness for another emergency. The latter cost is about $600,000 a year. The company feels that Navy should pay its share of the readiness program cost, about $400,000, on the ground that keeping the reserve in condition for an emergency is a national defense project.

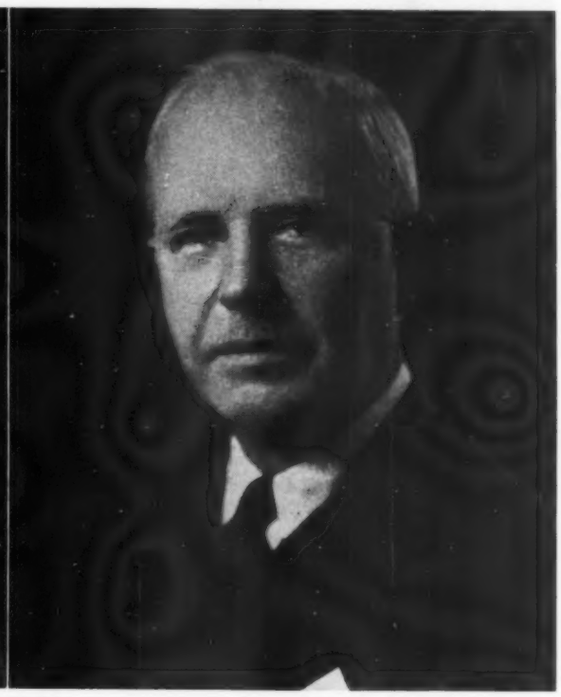
STANDARD-VACUUM ADVANCES EXECUTIVES

FOLLOWING the retirement of George S. Walden as chairman of the board of Standard-Vacuum Oil Company, Philo W. Parker has been elected to succeed him. Lloyd W. Elliott succeeds Mr. Parker as president. The company also announced the election of C. E. Meyer and C. K. Gamble as vice-presidents.

Born in Brooklyn, in 1892, Mr. Walden obtained his education in grade, high and night schools, starting to work in 1908. He became manager for Standard Oil Company (N. J.) in the Argentine in 1921, in the Netherlands East Indies in 1924, and in Holland in 1929. On the formation of Standard-Vacuum Oil Company in 1933, Mr. Walden became vice-president. The following year he was made chairman of the board of directors and chief executive officer.

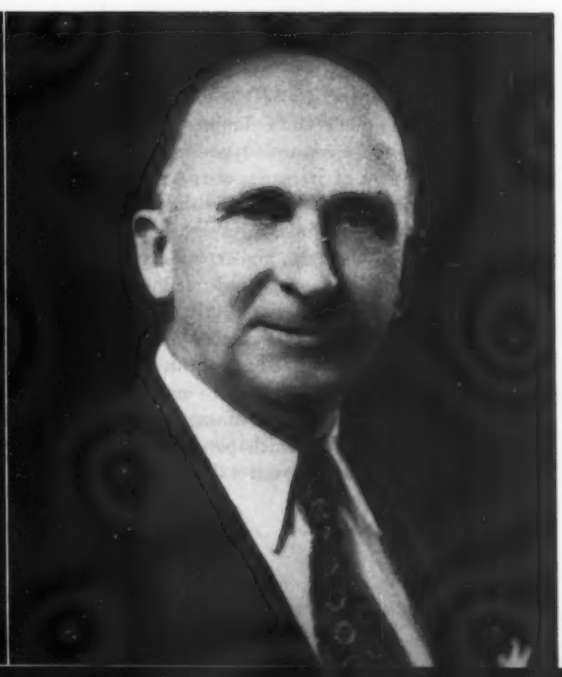
Mr. Parker was born in Georgetown, N. Y., in 1891, and was graduated from Colgate University in 1912. Enrolling in the first marketing class established by Standard Oil Company of New York, Mr. Parker was assigned to South China in June, 1912. He was named general manager of South China in 1926 and in 1931 became a director of the company. The following year he was named vice-president. In 1933, he transferred to Standard-Vacuum as a vice-president and in 1934 was named president.

Lloyd W. Elliott



Philo W. Parker

C. K. Gamble



C. E. Meyer

Mr. Elliott was born in Chelsea, Okla., in 1900, and attended Tulsa University. While a student he entered the oil business, doing general work for Carter Oil Company. In World War I, he served 16 months in France. In 1919, he returned to Carter Oil Company and the following year was sent to Mexico. He was transferred to Netherlands East Indies in the fall of 1924 and placed in charge of constructing a pipeline from the Talang Akar-Pendopo fields to the Palembang refinery. In 1928 Mr. Elliott was named acting general manager of the Nederlandsche Koloniale Petroleum Maatschappij. The following year be became manager and served in that capacity until the Japanese invaded South Sumatra in February, 1942. He was commissioned a Major in the U. S. Army in Java. When Java fell to the enemy, he joined General MacArthur in Australia. During the three years he served on General MacArthur's staff, he rose to the rank of Colonel and was in charge of petroleum supplies and construction of storage facilities. The Distinguished Service Medal was awarded to Colonel Elliott for this work. On completion of the Philippine campaign he returned to Standard-Vacuum. In May 1945, he became a director and later was named vice-president.

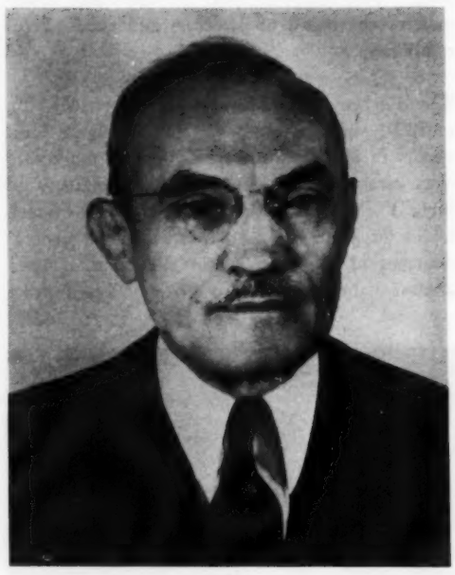
A native of Ashford, N. Y., Mr. Meyer was graduated from Syracuse University in 1913. The same year he was sent by Standard Oil Company of New York to China where he remained until 1935, when he was transferred to Japan. In 1936, he was named general manager of the company's operations in Japan and served in that capacity until Pearl Harbor, when he was interned by the enemy. In August, 1942, he was returned to the U. S. aboard the Gripsholm. From August, 1943, until May, 1945, Mr. Meyer served as Petroleum Attache in the U. S. Embassy in London. He rejoined Standard-Vacuum in June, 1945, as a director.

Mr. Gamble was born in San Mateo, Calif., in 1889 and was graduated from the University of California. He was employed by Standard Oil Company of New York in 1916. He served overseas in the First Division, A.E.F., in World War I. Returning from service, Mr. Gamble represented the company in Turkey, Syria and Greece until 1927, when he was assigned to Australia and New Zealand. In 1938 he was named board chairman, Vacuum Oil Company Pty. Ltd. In January 1942, he was named high commissioner, American Red Cross for South and Southwest Pacific, and served in this position for three and one-half years. In August 1945, Mr. Gamble returned to the United States and was named a director of Standard-Vacuum.

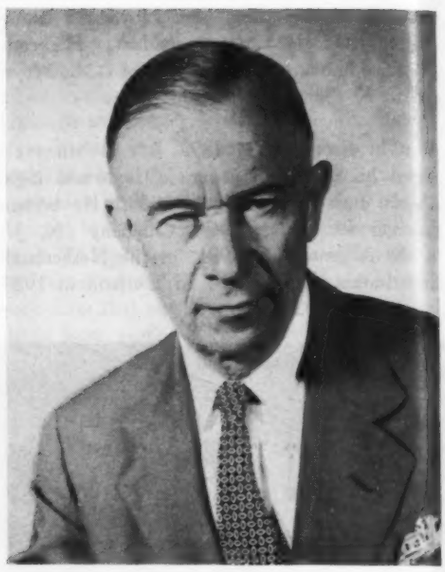
CHEMISTS DISCUSS PETROLEUM PROBLEMS

THE Petroleum Division of the American Chemical Society celebrated its 25th birthday at a dinner at the Palmer House, Chicago, on September 10, at which Bruce K. Brown, vice president, Standard Oil Company (Indiana) delivered an address "Petroleum '21 to '71" in which he contrasted the 1921 fears over the future of the country's oil supply with the current optimism on this subject based on improved methods of discovery and the progress made in the production of synthetic fuels and lubricants. Pessimism still exists, he continued, but now it is focused on the possibility of atomic power replacing petroleum, a possibility Brown considers very remote, except perhaps in the case of ships.

Speaking of Diesel power, Mr. Brown predicted that it would increase many fold within the next few years. The swing to Diesel power in locomotives is but an example, although in this particular case new methods for utilizing coal are also being developed. For trucks, ships, and aircraft, however, there will be an ever increasing demand for fuels of petroleum origin. The future of the chemical industry based on petroleum is but another reason for the members of the petroleum industry to face the future with optimism, Brown said. Other speakers on the anniversary program were T. G. Delbridge of the Atlantic Refining Company, C. R. Wagner, secretary of the division, and C. D. Lowry, Jr., of Universal Oil Products Company who recalled the early days of the division in a talk entitled "The Problems of the Petroleum Chemist Twenty-Five Years Ago."



Dr. Gustav Egloff, of Universal Oil Products Company.



Dr. A. N. Sachanen, of Socony-Vacuum Oil Company.

Among the twenty papers at the meeting was one presented by R. C. Hansford of Socony-Vacuum Laboratories, explaining a mechanism of catalytic cracking. It was shown that the link between the catalyst and the oil is adsorbed water. A catalyst from which this water has been partially removed is found to be much less active than one that has been preconditioned by allowing it to adsorb up to 0.29 percent weight water. While these observations were based only on laboratory scale experiments using normal butane, work is undoubtedly underway to determine the effect of water when using commercial feeds.

As an example of the effect of adsorbed water on the activity of commercial synthetic silica-alumina catalyst when cracking normal butane, Hansford presented data on the percent butane decomposed after 30 minutes at 480°C. With a partially dehydrated catalyst, decomposition was 29 percent; addition of 0.29 percent water to the catalyst by exposing it to a wet stream of air at 482°C. increased decomposition to 40 percent. Proof of the role played by water was obtained by adsorbing heavy water (deuterium oxide) on the catalyst. Mass spectrometer analysis showed extensive heavy hydrogen (deuterium) exchange in the cracked products as well as in the uncon vented butane. This theory of proton exchange has application in many reactions such as polymerization, cyclization and others. It points the way to increased yields in catalytic cracking by the possible injection of controlled amounts of water in the feed.

Flexibility of fluid-type catalytic cracking was illustrated by a series of experiments carried out by Starr, Tilton, and Hockberger of the Esso Laboratories of Standard Oil of New Jersey in Baton Rouge. They presented results based on runs employing naphthenic and paraffinic feed stocks in 2 BD/D and 100 B/D pilot plants. Both clay and synthetic silica-alumina catalysts were used. From naphthenic-type feedstocks higher concentrations of aromatics were obtained, particularly toluene and C_8 aromatics, than when the feedstock was paraffinic. Naphthene and cyclo-paraffin yields were also higher, but for the production of C_4-C_7 paraffins and olefins the paraffinic feeds are to be preferred. It was also brought out that fluid catalyst cracked naphthas are a not too promising source of benzene, cyclopentane, cyclohexane, normal paraffins, and diolefins. On the other hand, the advantage of fluid cracking is the flexibility which permits operation for the production of such valuable intermediates as isolutane, isobutylene, normal butylenes, toulene and other relatively low-boiling aromatics.

The selective hydrogenation of olefins in catalytically cracked aviation naphthas was the subject of a paper presented by Drs. Alexis Voorhies, Jr., W. M. Smith and C. E. Hemminger. Drs. Voorhies and Smith are attached to the Esso Laboratories, Standard Oil Company of New Jersey, Baton Rouge, and Dr. Hemminger is associated with the Standard Oil Development Company at Bayway, New Jersey. The process is operated on a large scale, high-pressure basis at Jersey's Baton Rouge plant, and on a low pressure basis in a plant operated by the Humble Oil and Refining Company, Baytown, Texas, for the Defense Plants Corporation. Need for selective hydrogenation grew out of the use of catalytically cracked naphthas as base stocks in the 100-octane aviation gasoline program. These naphthas were produced by high-temperature cracking (950-975°F) which resulted in gasolines high in aromatics and olefins. Consequently, although these fuels had high rich-mixture ratings, their lean-mixture octane rating was undesirably low. The solution appeared in the development of hydrogenation techniques for converting the olefins to parafins without reducing the aromatic content. Hydrogen pressure at the Baton Rouge plant is 3,000 psi while at the Baytown plant pressures of only 150 psi were used. The catalyst

is apparently of the sulfur-resistant type and has excellent life.

Recent improvements in gasoline treating were discussed in a paper presented by John Happel and S. P. Cauley of Socony-Vacuum. Such techniques as the Shell Solutizer process have made possible complete removal of mercaptans rather than conversion of these undesirable components to the less innocuous disulfides. These methods use, for the most part, alkali metal hydroxide solutions to which have been added compounds to increase the solubility of the mercaptans in the treating solutions. In general, two distinct operations are involved in these processes; extraction of the mercaptans and regeneration of the treating solution.

While the extraction step has proved successful, the regeneration of the solution has presented, until recently, certain difficulties. Moreover, as the authors pointed out, the agents which have increased the effectiveness of the caustic extracting solutions, have if anything made the regeneration harder. Since the regeneration step represents a substantial part of the treating costs, any improvements in this direction are of more than casual interest to gasoline producers.

Happel and Cauley reported their success in finding catalysts that would effectively catalyze to disulfides the mercaptans in the spent solution, after air blowing at atmospheric temperatures. These disulfides are insoluble in the treating solution and may be separated by simple settling or other suitable means. The catalysts are tannic acid or tannins, phenolic acids, and polyhydroxybenzenes, all insoluble in the gasoline and relatively stable under the conditions of extraction and regeneration.

Results of commercial application of the process were reported, using chestnut tannin extracts in a 1000 barrel per day motor gasoline plant. The gasoline fed to the system is a Talco crude containing 0.060 to 0.075 percent mercaptan sulfur. The treated gasoline has a mercaptan content of 0.003 percent or less. During seven months continuous operation, only 480 pounds of tannin have had to be added. In the ensuing discussion a representative of the Shell Companies reported on the operation of the Tannin-Solutizer process in Shell plants. In the Houston refinery of his company the plant for sweetening gasoline requires only one operator and no technical supervision.

Application of this process to the treatment of butane stocks is already underway according to the Socony representatives. This is particularly attractive since methyl mercaptan is very hard to remove from treating solutions by conventional steam-stripping. The authors pointed out that caustic soda regenerators operated by steam stripping could readily be converted to low-temperature tannin units. As a result, they stated, corrosion would be decreased and the use of ordinary steels would be satisfactory.

George L. Hervert and Carl B. Linn of Universal Oil Products Company told the society that acetone can be produced by catalytic conversion of isopropyl alcohol, using nickel as a catalyst. The same process also can produce methyl isobutyl ketone, known commercially as Hexone, and diisobutyl ketone, both of which products are of higher value than acetone. The new low temperature (400°) process using propylene as a raw material may permit reopening of hydrogenation plants shut down at the close of the war.

Nickel-on-kieselguhr catalyst was developed in the Universal laboratories and was used with marked success during the war for the hydrogenation of dimers of butylene to isooctane for 100-octane gasoline. When the demand for avaition gasoline declined, most of the hydrogenation plants were shut down.

Acetone is widely used in various industries as a solvent, in the manufacture of varnishes, explosives, plastics and other materials. Methyl isobutyl ketone is used as a solvent for nitrocellulose, in the manufacture of vinylite resins, milled crepe rubber and other products. It is believed that a large and profitable market awaits diisobutyl ketone.

At the business session, which ended the two-day program, Dr. Gustav Egloff, of Universal Oil Products Company, was elected chairman, and Dr. A. N. Sachanen of Socony-Vacuum Oil Company was elected vice-chairman. Cary Wagner, consulting chemist, was re-elected secretary-treasurer. Dr. S. S. Kurtz, Jr., of the Sun Oil Company, the retiring chairman of the division, and Dr. W. E. Bradley, of the Union Oil Company of California, were elected members of the executive committee.

PATENT LAW REVISION

PROPOSED revisions in the patent system in America and England were discussed by P. J. Frederico of the U. S. Patent Office at the recent annual meeting of the American Chemical Society at Chicago. He referred to the work of the American committee which has not yet made its report and discussed findings of the committee that has been working in England along similar lines.

The British committee was appointed by the president of the Board of Trade in April 1944, and issued its first report in April 1946. In making its study, it received the cooperation of the British chemical industry and the chemical societies of Great Britain. Particularly interesting is the result of its investigation of the suppression of patents. It concluded, after careful consideration of all evidence, that no example of this claimed restriction and improper use of patents existed in the British isles.

In the matter of cartels, the committee decided that the role played by patents in fostering these combines has been vastly overrated. The committee was of the opinion, however, that patents do play a part in the formation and operation of cartels which may be contrary to the purpose of the patent law.

Section 27 of the British Patent Law sets forth conditions under which compulsory licensing of patents is permitted. In general, the committee approved of this provision since the conditions usually relate to what probably amounts to restraint of trade. For example, compulsory licensing is permitted if the demand for the patented article in the United Kingdom is not being met on reasonable terms. In revising this section, the committee has suggested that compulsory licensing be granted if an export market exists which is not being satisfied. Another reason for compulsory licensing, in the eyes of the committee, would be if the patent is essential to the operation of a new process.

A proposal, made in the United States by the Temporary Economic Committee, that all patents be made available for licensing by all comers was rejected by the English body. In fact, the English group recommended repeal of Section 38A of the British Patent Law which calls for the unrestricted licensing of all patents having to do with food and drugs.

British patent custom differs from the American, Mr. Frederico pointed out, in that a patent is granted not so much on the grounds of invention as on whether the disclosure has been wholly and specifically described elsewhere in the United Kingdom. If it has not, the patent is usually granted. The committee suggested that more consideration be given to the question of invention as is done in America.

In the matter of patent litigation, the English committee was of the opinion that it is too costly and in addition that the courts are inadequate. A recommendation has been included that judges be appointed from the bar who have had scientific and technical training. The committee also recommended that a scientific assistant be asked to sit in on all cases when the judge may think it helpful.

In conclusion, Mr. Frederico drew attention to the committee's recommendation that infringment suits amounting to less than £1000 be tried by the patent commissioner. If both parties agree to this procedure, the decision of the commissioner would be final. The British committee is continuing its study.

International News and Notes

World Oil Co-operative

Formation of an international co-operative to handle the distribution of petroleum products in a number of countries is projected at the meeting of the International Co-operative Alliance in Zurich, Switzerland during the second week of October. Moving spirit in the undertaking is Howard A. Cowden, president of Consumers Co-operative Association which has greatly extended its operations in the United States. On his departure from New York early in September to attend the meeting Mr. Cowden stated that the immediate objective so far as oil is concerned would be the establishment of marketing co-operatives in a number of European countries but that later on the organization might engage in production and refining and operate its own transportation facilities. He advocated the placing of oil under international regulation to avoid dangerous controversies from the scramble of nations and private interests for control of petroleum resources.

Studying Use of Oxygen

A study of German developments in the use of oxygen in the synthesis of liquid hydrocarbons is being made under the direction of the Office of Technical Services of the U. S. Department of Commerce. The investigating group consists of four technical experts associated with Hydrocarbon Research, Inc. which has pioneered in the United States in the use of oxygen in this connection. They are Dr. Clarence Johnson, Dr. J. B. Sevearingen, Norman F. Buschow and Edward F. Engel.

Creole's Production Rises

Reflecting the strong demand for oil a mid-year report of Creole Petroleum Corporation showed an output by that Venezuelan operator of 95,520,040 barrels in the first six months of 1946 as compared with 73,875,000 in the corresponding period of last year, a gain of 29.3 percent. Current production is about 570,000 barrels per day. Earnings for the half year were approximately $48,500,000. President A. T. Proudfit reported that in addition to its extensive drilling and production program, in which a large portion of these earnings will be invested, the company will spend $87,000,000 in Venezuela on the expansion of facilities to meet increased demands for crude oil and refined products. The new projects, including the refinery previously announced, and additional transportation facilities, will be financed out of earnings.

U. S. Sales of Surplus Ships

An interim report of the U. S. Maritime Commission shows that up to the end of July last its small vessel division had disposed of 2,203 surplus ships built or acquired during the war for a total of $94,709,477. During July 335 vessels were disposed of through public sale plus 92 sold back to their former owners or to government agencies. Included in July transactions were two tankers sold to the Ming Sung Industrial Co. Ltd. of Chungking, China.

Refining at Aruba

During the month of July, the Aruba refinery of the Lago Oil and Transport Company Ltd., an affiliated company of Standard Oil of New Jersey, refined 11,059,000 barrels of oil, or 656,000 barrels more than in June. This figure represents a daily average of 356,740 barrels and tops four previous monthly records of 1946.

Egypt Seeking Pipe Line

Anglo-Egyptian Oilfields Company has been granted a license for prospecting in the Sinai and the eastern deserts. Announcing this in the Chamber of Deputies, Sidky Pasha, the Egyptian Premier, added that an agreement was approaching completion with the American-Arabian Oil Company to construct a pipe line from Saudi Arabia to Egypt and build a refinery at an Egyptian port, either Suez or Alexandria.

New Refinery for Borneo

According to a press report from Singapore, the Royal Dutch Shell group is to build a new oil refinery on Muara Island, in Brunei Bay, in British North Borneo, to replace the Miri oil refineries destroyed during the war. Muara has deep water where tankers can be loaded two miles off-shore with a pipe line. According to the report drilling will shortly be resumed both in Sarawak, west of Miri, and in Borneo, east of Brunei, to increase the available supply of crude.

Philippine Oil Search Resumed

Search for petroleum deposits in the Philippine Islands, interrupted by the war in the Pacific, will be resumed by the Far Eastern Oil Development Co. Inc., with the aid of U. S. capital, it was revealed today in an announcement made by E. D. Woodruff, president of Occidental Corporation, a wholly-owned subsidiary of Transamerica Corporation. Occidental Corporation has acquired a substantial interest in Far East Oil Development Co., Inc., a Philippine organization holding the only two privately-owned oil and gas leases not cancelled by the Philippine Petroleum Act of 1937.

According to Colonel Andres Soriano, president of Far East, a well was being drilled on the Company's lease which, on November 30, 1941, was coring saturated oil sands. After Pearl Harbor, December 7th, operations were ordered suspended by General Douglas MacArthur and all physical evidence destroyed. The leases, comprising a total of approximately 70,000 acres and located in the northern part of the Island of Cebu and on Bondoc Peninsula on the southwestern tip of the Island of Luzon.

Among the other stockholders in the Far East Oil Development Company, Inc., is the Caltex Corporation, jointly owned by the Standard Oil Company of California and The Texas Corporation.

New Colombia Oil Law Discussed

Inauguration of Mariano Ospina Perez as president of Colombia and convening of the 150-day session of Congress have created a great deal of new interest in modification of the Colombia oil law. New tax bills also are a center of interest.

Not long ago it was rumored that Richmond Petroleum Company was planning to withdraw from Colombia and that Shell had cancelled a number of leases. It was stated that this action was planned because of difficulties of operating under the present law. Former President Lopez was quoted as saying that the companies needed 20 lawyers for every engineer.

The rumored withdrawals have been denied by the Minister of Petroleum who asserted that any oil law passed by Congress will be equitable.

Panama Grants Concession

Sinclair Panama Oil Corporation has been granted a 20-year concession covering 7,25°,000 hectares by the Republic of Panama. The concession is renewable for a second 20-year period. The company, jointly owned by Venezuelan Petroleum Company and Cities Service Company, obligates itself to undertake exploratory work within 90 days. Within three years the company may select areas it wishes to develop and relinquish the remainder. Drilling of areas retained must then be begun within six months.

The company is required to pay $25,000 a year for each of the three years of the exploration period and thereafter to pay rentals on acreage retained for development. Royalty to the Panamanian Republic for a period of ten years and to employ in its op- will be of 16⅔% on gross production of oil or Panama may elect to receive royalty in kind.

The Panamanian Constitution provides that the subsoil belongs to the nation. In cases where private land owners have acquired sub-soil rights prior to the effective date of the Constitution, the landowner is to be entitled to one-third of the 16⅔% royalty to be paid to the government.

Included in the concession is the right to refine, manufacture, transport and market petroleum and petroleum products. With respect to these activities, when undertaken, the Government is to receive 25% of net profits. The company agrees to establish a program for the training of Panamanian personnel erations the greatest possible number of Panamanian citizens.

LLOYD SMITH has resigned as president and general manager of Lago Oil & Transport Company, Aruba, Netherlands West Indies, to join the foreign refining coordination department of Standard Oil Company (New Jersey).

Succeeding Mr. Smith at Lago, an affiliate of Jersey Standard, will be John J. Horigan, who has been a director of Lago since January, 1942. Mr. Smith, a graduate in mechanical engineering from the University of Illinois, has been an oilman since 1913. Mr. Horigan, a graduate in civil engineering from Yale, has been associated with the petroleum industry since 1920.

Mr. Smith's career at Lago was climaxed on July 31 when Her Majesty Queen Wilhelmina by special royal decree awarded him the decoration of Knight Commander of the Order of Orange-Nassau.

ALEXANDER L. McCOLL who retired last year after 40 years of service with Vacuum Oil Company Ltd. of London has been honored by King George with a knighthood conferred in recognition of his outstanding service as a leader in the British oil industry's war effort. Sir Alexander was born in Kilmarnock, Scotland, and entered the employ of Vacuum Oil Company in 1905. During World War I he had charge of the company's relations with the government. In 1919 he became a member of the board of directors; in 1933 he was made deputy chairman and in 1936 was elected chairman, a post which he retained until his retirement.

TWO PROVED BRITISH PRODUCTS FOR THE PETROLEUM INDUSTRY

Klinger Reflex Level Indicators withstand pressures up to 1,200 lbs. per square inch, and temperatures up to 800° F. They can be built up to any desired length, and are suitable for high-pressure stills and cracking plant, for reaction chambers and for all purposes where variations of temperature and pressure are severe. All component parts are standardised: Klinger gauges are easily maintained or replaced.

"Klingerit," the universal compressed asbestos sheet packing (high pressure jointing) is available in sheets up to 80″ x 240″ in area, and in thicknesses from .008″ to ¼″. Suitable for use on all modern high-pressure plants — oil, chemical and industrial—it will withstand working pressures of 5,000 lbs. per square inch and temperatures of 900° F. Impervious to steam, gases, chemicals and oils, "Klingerit" can also be supplied as ready-cut gaskets.

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Oil Company Staff Changes

CHARLES P. BAKER, who was transferred recently from Magnolia Petroleum Company to the East St. Louis refinery operated by Lubrite Division of Socony-Vacuum Oil Company, has been advanced from general plant superintendent to plant manager of the East St. Louis refinery. He was technical advisor to the operating department at the Beaumont refinery of Magnolia Petroleum Company prior to January 1. He was transferred to East St. Louis as assistant to W. H. Montgomery, plant manager, and on March 1, was promoted to general plant superintendent. During the war, he advanced from Second Lieutenant to the rank of Major, assigned to the Petroleum Administration for War as chief of the aviation section. Mr. Montgomery is being transferred to New York as industrial relations manager of Socony-Vacuum Oil Company.

RALPH G. McINTYRE, of El Paso, has been elected president of the Standard Oil Company of Texas, a subsidiary of Standard of California. He previously was vice president in charge of manufacturing and sales and succeeds the late A. J. Cunningham. McIntyre went to work for Standard of California in the Richmond (California) refinery in 1910 and was transferred to Texas in 1930.

Three new directors, all Houston residents, were named, J. P. Fox, vice-president in charge of exploration; C. W. Reith, vice-president in charge of production and H. L. Smith, vice-president, secretary and treasurer.

ELLIOTT B. McCONNELL has been appointed vice president in charge of manufacturing and elected a director of the Standard Oil Co. (Ohio). He was general manager of the manufacturing department, before the retirement of George W. Hanneken on September 1.

Mr. McConnell joined Sohio in 1928 after several years with Standard of New Jersey. The following year he was made assistant to the vice president in charge of manufacturing and in 1945 was made general manager of the manufacturing department. In 1942 he spent several months in Washington as special assistant to the director of the refining division of the PAW on aviation gasoline.

GEORGE W. KNIGHT who has been export representative of Rheem Manufacturing Company with headquarters in New York has been appointed manager for Standard Oil Co. (N. J.) in Peru and will take up residence in Lima. The New York chapter of Nomads in which Mr. Knight has taken an active part since its organization is presenting to him a certificate of appreciation for his service as member and officer in building up the organization.

ROLAND V. RODMAN was elected president of Bay Petroleum Corporation, Denver, to succeed Charles U. Bay who has been appointed ambassador to Norway. The company has a refinery in Denver and interests in Kansas, Illinois, Oklahoma, Texas, New Mexico, Louisiana and California. Rodman, a lawyer, joined the Bay organization in 1939 as vice-president and general manager.

GEORGE W. HANNEKEN, vice president in charge of manufacturing of The Standard Oil Company (Ohio), retired September 1 after 44 years devoted to the oil industry.

He became a pipe fitter helper working on the expansion of the Neodesha Refinery of the Standard Oil Company in Kansas when he was 21. He joined Sohio in 1917.

DR. EUGENE B. NUGENT has been appointed manager of Sun Oil Company's automotive sales engineering division. The new division will offer technical assistance to Sun customers in the proper application and operation of petroleum products. Through close contact with the research laboratories, the division will coordinate for the various Sun Oil sales departments all matters having to do with the technical application of automotive fuels and lubricants.

FRED POWELL, manager of the refining division of Standard of California's El Segundo plant, has been appointed president of the recently-formed California Refining Company. The new corporation was organized to operate the Barber Asphalt marine terminal and other facilities near Perth Amboy, New Jersey. Mr. Powell went to work for Standard at its Richmond refinery in 1925. He has been at the El Segundo plant since 1941.

C. A. POLLARD has been made assistant general manager of Standard of California's Richmond refinery. A Standard Oiler since 1921, Pollard has been at the Richmond refinery for the past 16 years, most recently as manager of the refining divisions. C. W. Rehfuss, manager of service divisions at Richmond, becomes manager of the refining divisions. Rehfuss has been with the company for 22 years.

P. C. WHITE has been made chief chemist of Standard Oil Company of Indiana's Whiting refinery. He succeeds F. M. Rogers, retired. Dr. White joined the Indiana company after receiving his Ph.D. from the University of Chicago in 1938. He became assistant chief chemist in 1945.

R. F. Marschner has been made section leader in charge of exploratory research on petroleum processes. Other members of the research staff have been promoted to the following positions: J. C. Bailie, acting assistant chief chemist; W. J. Tancig, group leader in charge of analytical methods application; A. P. Lien, group leader in exploratory research; J. J. Lukes, group leader in the pilot plant section; and H. S. Wood, group leader in the light oils section of the technical service division.

FRANK C. MEUNIER has been made manager of advertising and sales promotion of the General Petroleum Corporation. Meunier joined General Petroleum in 1932. A year ago he was appointed sales promotion manager.

THOMAS E. FISKE, an attorney for Standard Oil Company (Indiana), has now taken over the company assignments previously handled by Frank E. Packard. Mr. Packard retired September 1, after having been general and tax attorney for more than 25 years.

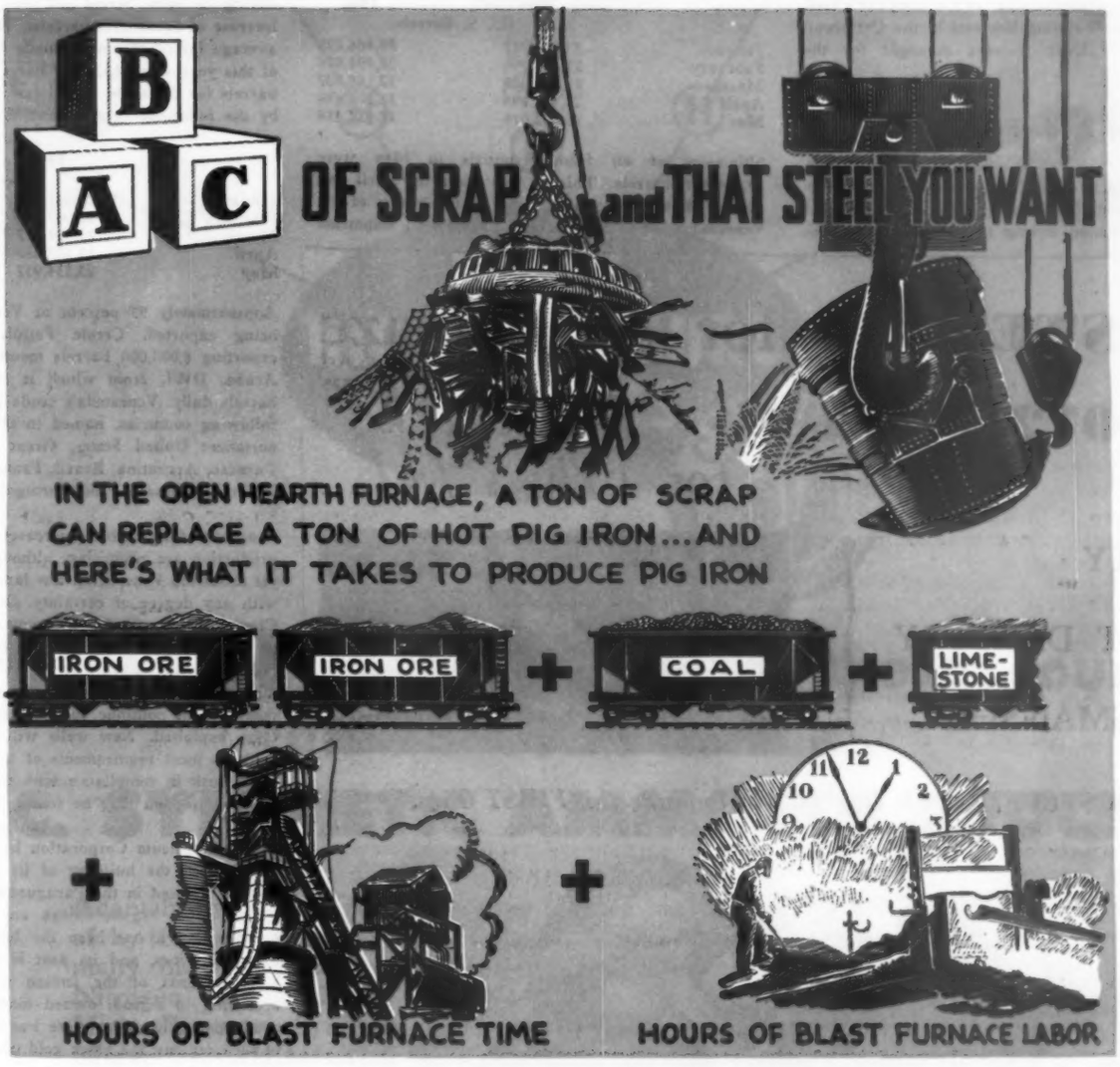
DR. FRANK J. GARDNER who was a member of the Rinehart Oil News Company's staff in Houston prior to his entering the armed services in August 1942 has returned. He will devote much of his time in the next few months to an up-to-date issue of "South Texas Oil" and Rinehart's Yearbook 1947.

GLENN W. POORMAN has been appointed assistant to M. J. Rathbone, president of the Standard Oil Company of New Jersey. Mr. Poorman entered the employe of the Standard Oil Company of Louisiana in 1932 as a chemist in the refinery laboratory. A series of promotions brought him to the post of assistant to the general manager of supply and transportation, where he has served since 1944. R. A. Appleman succeeds Mr. Poorman.

Elliott McConnell

Fred Powell

Glenn Poorman



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But every extra ton of pig iron produced calls for the use of approximately two extra tons of iron ore, one extra ton of coal and one extra half-ton of limestone, processed in a blast furnace, involving many extra hours of time and labor. It is obvious that there is a limit to America's blast furnace capacity. So the quickest, most effective way to produce maximum steel tonnage now is to find and use more scrap.

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Whessoe Office in Venezuela

OFFICES have been established by Whessoe Limited of Darlington, England, in Caracas, Venezuela, to accommodate the administration of the company's tank and refinery plant building interests in the Caribbean area. S. W. G. Dear is area manager for the company.

Venezuelan Production at New High

CARACAS.

As was expected, Venezuela's oil production so far this year, for the period January to May, has exceeded last year's production during the same period. Production increases have been noted in every oil field in the country. Production for the first four months of the two years was as follows:

	1945	1946
	(U. S. Barrels)	
January	23,039,977	30,466,029
February	21,643,994	28,004,056
March	24,672,629	32,166,807
April	24,771,399	31,277,096
May	26,662,014	32,433,934

Shipments of oil from terminals in May were 29,458,479 barrels. This is less than in April but greater than any previous month in the history of the Venezuelan oil industry. Daily average oil shipments during May were 950,268 barrels, against 984,838 barrels during April. During the first five months of the current year total oil shipments amounted to 141,659,549 barrels, against 108,900,525 barrels shipped during the same period last year, which represents an increase of 32,759,024 barrels. Therefore, the monthly average for oil shipments made from January to May of this year was 28,331,909 barrels, against 21,780,105 barrels for the same period last year, as will be seen by the following comparison:

	1945	1946
	(U. S. Barrels)	
January	20,361,780	27,918,121
February	19,002,134	25,477,676
March	22,697,767	29,260,130
April	23,503,887	29,545,143
May	23,334,957	29,458,479

Approximately 95 percent of Venezuela's oil now is being exported. Creole Petroleum Corporation is exporting 8,000,000 barrels monthly to its refinery in Aruba, DWI, from which it refines about 200,000 barrels daily. Venezuela's crude oil exports go to the following countries, named in the order of their importance: United States, Great Britain, Aruba and Curacao, Argentina, Brazil, France and North Africa, Spain, Scandinavia and Portugal.

Prospects for further increases in Venezuelan oil production are promising, although little can be said yet about the Venezuelan low lands (Guarico district) with any degree of certainty. Oil companies such as Creole have invested large sums in exploration work in this district and geologists are optimistic, yet, only the drill will tell whether there is oil to be found in the vast territory. Most observers believe that production will continue to increase in the fields now being exploited. New wells will be drilled in known fields to meet requirements of the refineries that are to be built in compliance with the oil law no matter what production may be found in new fields.

Creole Petroleum Corporation has already selected a location for the building of its new refinery, which will be situated in the Paraguana Peninsula, State of Falcon. This region enjoys an important historical background; it has been the headquarters of many Caquetio tribes, and its past is interwoven with the historic deeds of the Indian chief Manaure who, according to legend, owned many gold mines. Such productive gold mines were lost mysteriously. Today, in such regions, the black gold comes to take its place. The new refinery proposed by Creole will have a daily capacity of 50,000 barrels and will cost approximately $65,000,000.

Launches New Tanker

STANDARD OF CALIFORNIA'S S.S. "F. S. Brant," first large tanker to be designed and built postwar in the United States, and named for a company vice president and director, was launched recently at Chester, Pa. Officials of both Standard and Sun Shipbuilding & Drydock Company, builders, participated in the ceremonies. The vessel was christened by Mrs. Brant.

John G. Pew, Pres. of Sun Ship, Mrs. Brant, F. S. Brant

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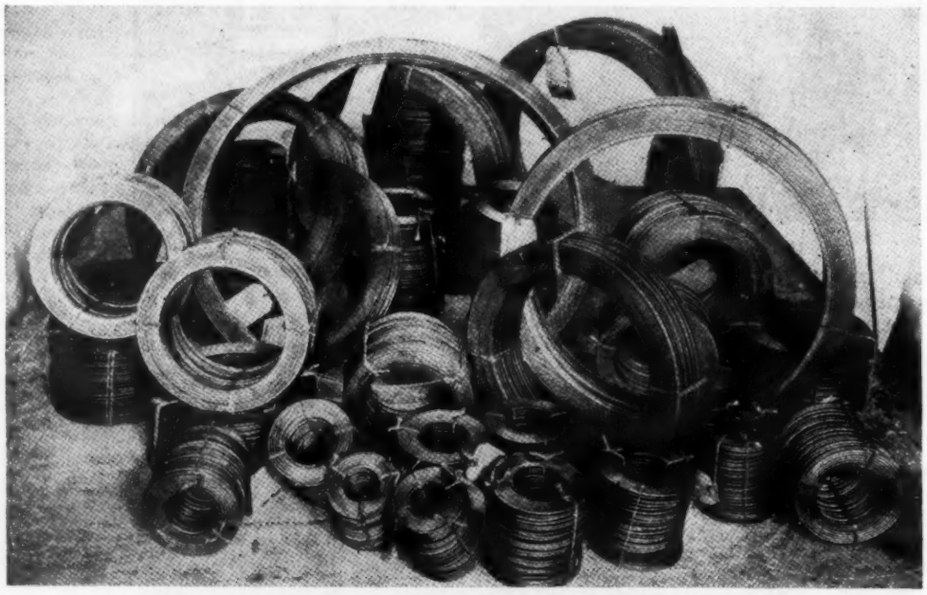

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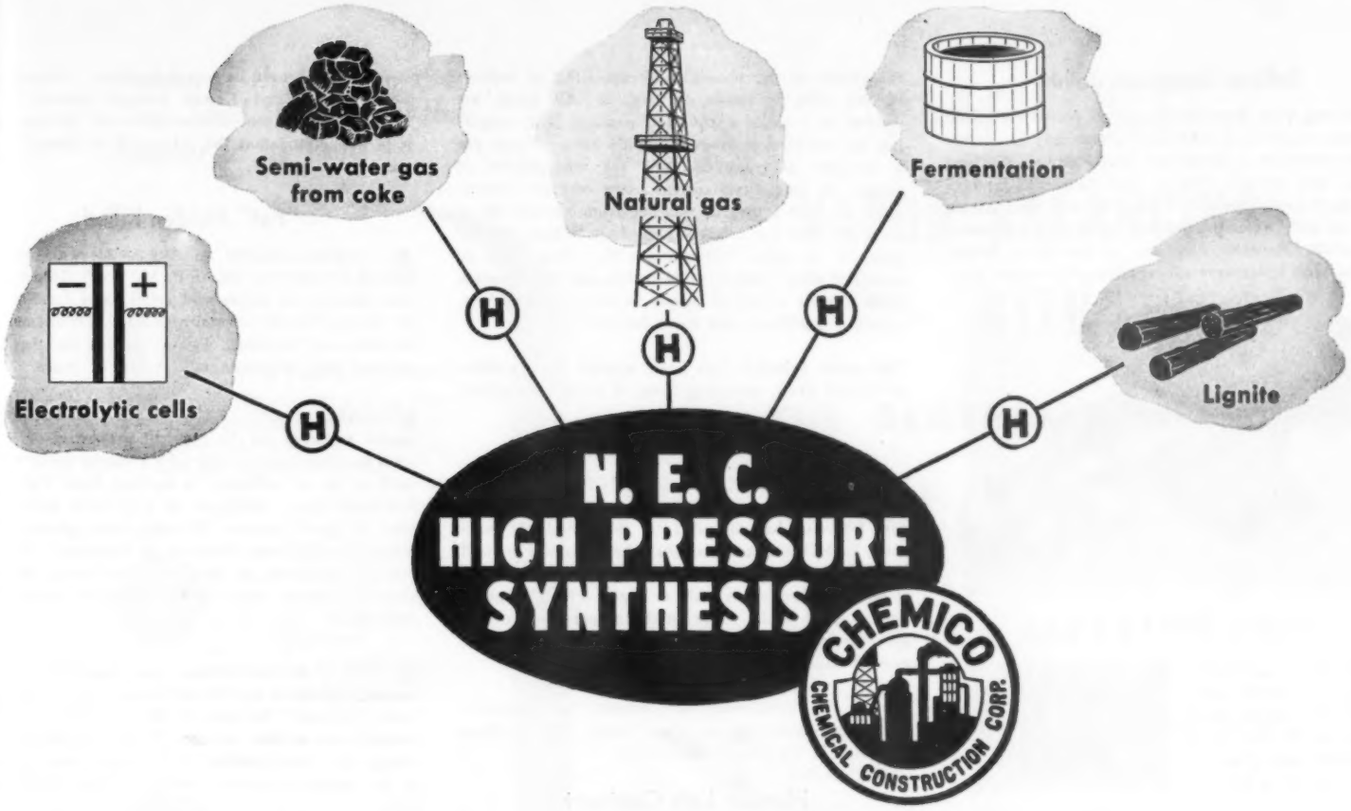

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The design and construction of N.E.C. Synthetic Ammonia Plants are based on more than 20 years of specialized experience; and the many N.E.C. installations are notable for their high efficiencies, favorable economies, and safety of operation. During the recent war, many of the ammonia plants for ordnance works in this country and Canada were supplied by CHEMICO, using its N.E.C. process.

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Bellows Expansion Joints

When long pipe lines are heated or cooled the metal expands or contracts with results that may be serious unless provision is made for absorbing the resulting strains and stresses. For a long time the standard method of doing this was to bend the pipe into hairpin loops or coils which would take up or give out necessary slack. Another way was to provide a length of tube with transverse corrugations that would permit the tube to give under pressure or stretch under a pull, the action being something like that of an expansible part of an accordion, or of a bellows.

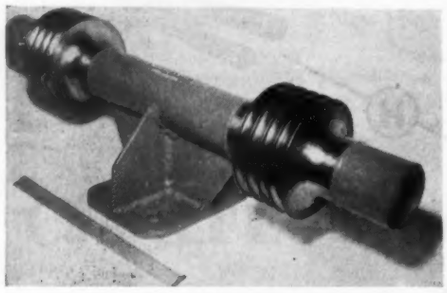


Figure 1

Figure 2

A novelty in this line is offered by the Magnilastic Division of the Cook Electric Company in the form of an "anchor joint." This joint consists of a short length of pipe bolted on a firm support with two bellows joints welded on at either end, as shown in Fig. 1. The arrangement of the accordion-like pleating of bellows of the joint is shown in Fig. 2. All parts are welded to produce a compact, packless joint requiring no reinforcing rings or guide rods. There are a number of types designed for transmission of steam, oil, gas, diesel exhaust, and corrosive chemicals; also for pressures ranging from vacuum up to 1000 psi and for temperatures from minus 300 degrees F. to plus 1600 degrees F. They come in standard sizes from ½ to 24 inches and can be made from a wide range of metals to correspond to temperature conditions and corrosion factors.

The same principle has been applied to a number of special cases, including those of turbo jet engines.

Moves Export Office

THE INTERNATIONAL DIVISION of the A. O. Smith Corporation, which handles the company's export business, has moved from the company's main plant in Milwaukee to separate headquarters in that city's downtown area. The purpose of the move was to make a physical as well as organizational separation of A. O. Smith's foreign trade operation, so that proper emphasis could be placed on the growing volume of export business.

Walter H. Porth, who has headed the company's foreign trade activity for three years, will continue in charge in the new headquarters.

Humble Lets Contract

THE HUMBLE OIL AND REFINING COMPANY has let a contract for the design and construction of a 4600 barrel per day solvent dewaxing unit at Baytown, Texas to E. B. Badger & Sons Co. of Boston, Massachusetts as a part of its program for expanding facilities for the manufacture of high quality lubricating oils to meet increased post war requirements. The Methyl - Ethyl - Ketone process, licensed by the Texaco Development Corporation, will be employed. It is anticipated that the plant will be placed in operation during 1947.

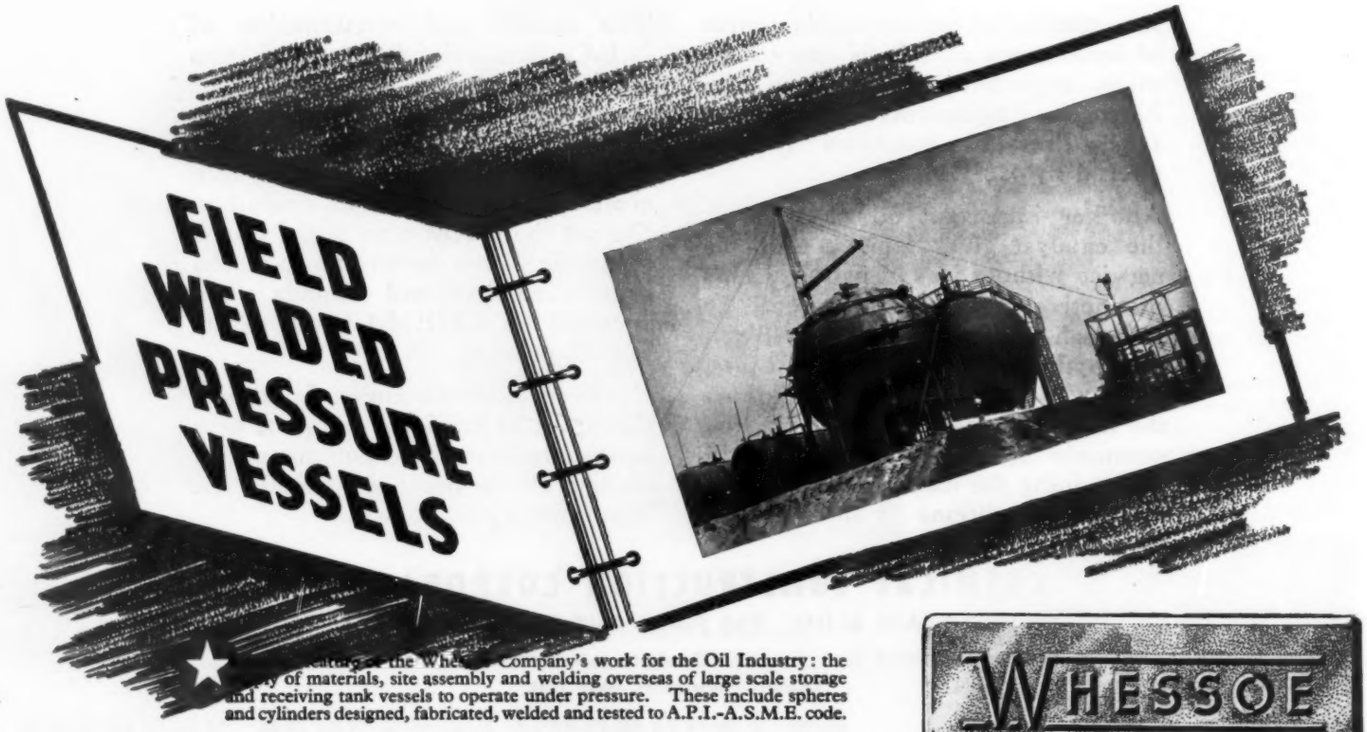
"Pat" Holden Killed

AN airplane accident on August 21 near the Enid airport claimed the life of P. M. "Pat" Holden, general manager of stores and retail sales for the Geo. E. Failing Supply Company of Enid, Oklahoma, and Houston and Midland, Texas. Holden had been associated with the company for twelve years.

EDWARD HANS ZEITFUCHS, internationally-known authority on the physical properties of petroleum products and inventor of a viscosity meter widely used in the oil industry, is retiring from California Research Corp., Standard of California subsidiary, after 25 years' service. He was senior physical specialist for California Research at Richmond. For the past several years he has been developing his own home laboratory, where he now plans to continue his research.

HENRY J. WALLACE has been appointed general manager of sales by United States Steel's National Tube Company. He succeeds W. F. McConnor who recently was elected National Tube vice president in charge of sales. Mr. Wallace has been sales manager of the eastern area with offices in New York since 1943.

R. G. FOLLIS, president and R. C. Stoner, vice-president, of Standard Oil Company of California, are spending several weeks in Venezuela on a tour of inspection of concessions held by the company's subsidiary, Richmond Petroleum Co. of Venezuela.



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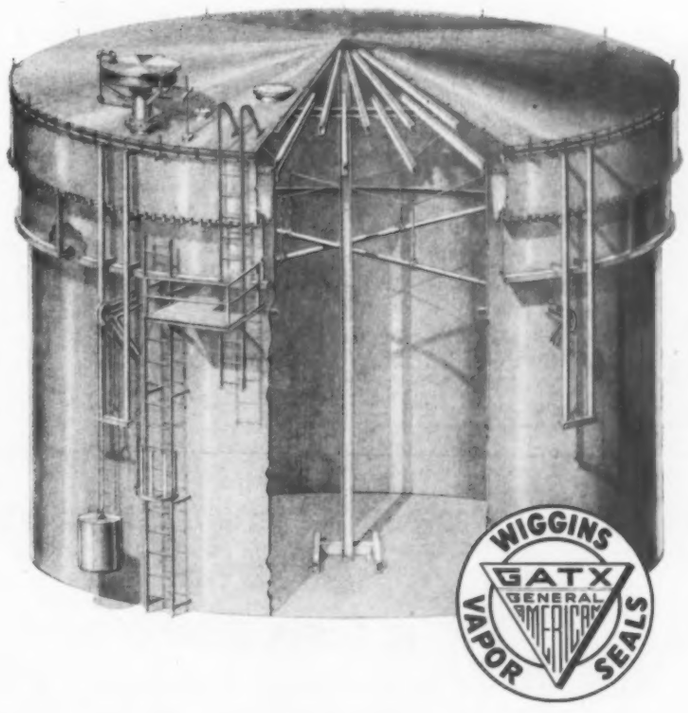

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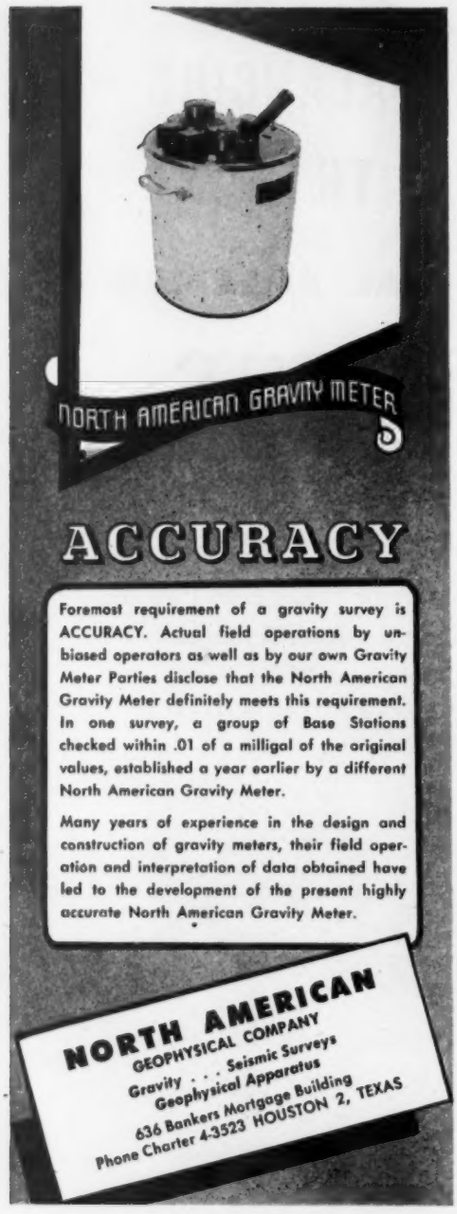
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Form Consulting Firm

ROLAND F. BEERS, president of The Geotechnical Corporation, and William B. Heroy, well known geologist and former director of foreign production for the Petroleum Administration for War, have announced the formation of the firm of Beers & Heroy, consulting geologists, geophysicists and engineers to the petroleum and mineral industries. Offices of the firm are in the Tower Petroleum Building, Dallas, Texas.

Halbert Evans Boner Dies

HALBERT EVANS BONER, 62, for the past 20 years vice-president in charge of manufacturing, and a director of Macmillan Petroleum Corporation, died August 24. He had been ill for seven days and was stricken with coronary thrombosis while on a vacation at his Lake Arrowhead summer home.

Emsco Promotes Roy Newcomb

EMSCO DERRICK & EQUIPMENT COMPANY announces the promotion of Leroy Newcomb from assistant to chief engineer of the Los Angeles machinery department. Mr. Newcomb has been closely associated with the petroleum industry for over fifteen years. In his new capacity, Mr. Newcomb will have jurisdiction over all engineering phases of Emsco's complete line of oil field drilling equipment manufactured in Los Angeles.

Erratum

A. H. Campbell

In the August issue of WORLD PETROLEUM the photograph of J. G. Campbell, new head of Shell Oil Company's economics department, was published in connection with the announcement of the appointment of Andrew H. Campbell as general sales manager for the eastern container division of Rheem Manufacturing Co. The accompanying photograph is of Andrew H. Campbell.

COOPER-BESSEMER CORP. has published two new bulletins for the files of oil industry engineers. No. 338 describes the new GMX compressor unit built in 4, 6, 8 and 10-cylinder sizes for oil field, gasoline plant, refinery or gas compressor station use. Bulletin L-51 gives specifications and rating curves for Type LS gas-diesel engines in 6, 7 and 8-cylinder stationary units.

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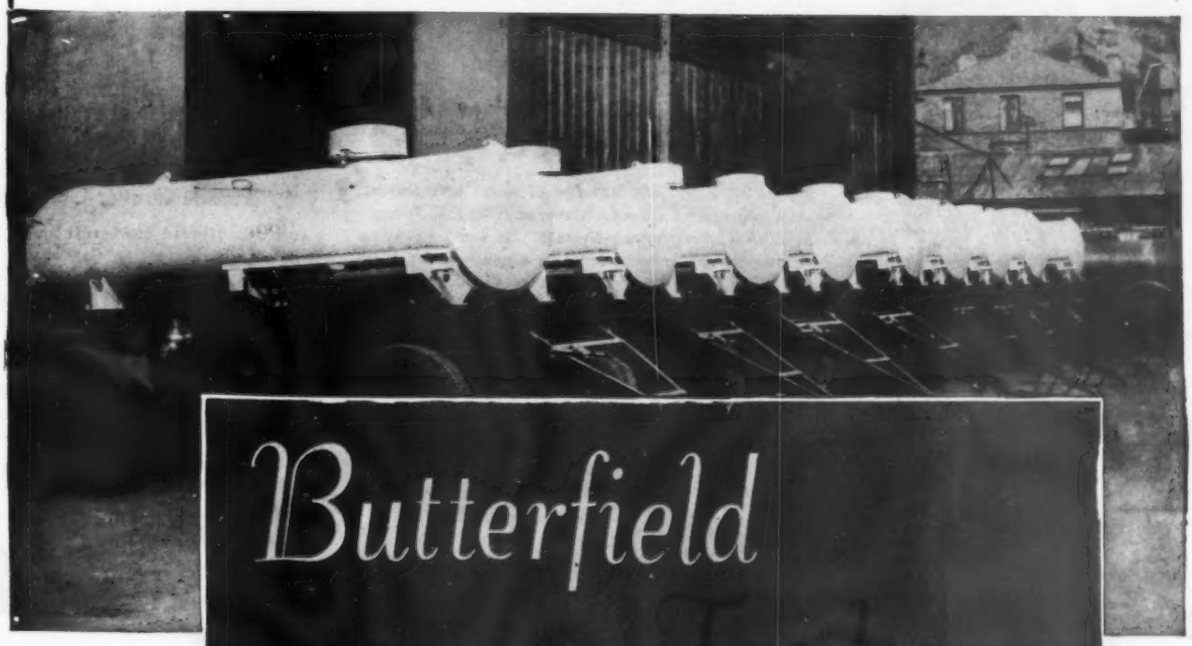
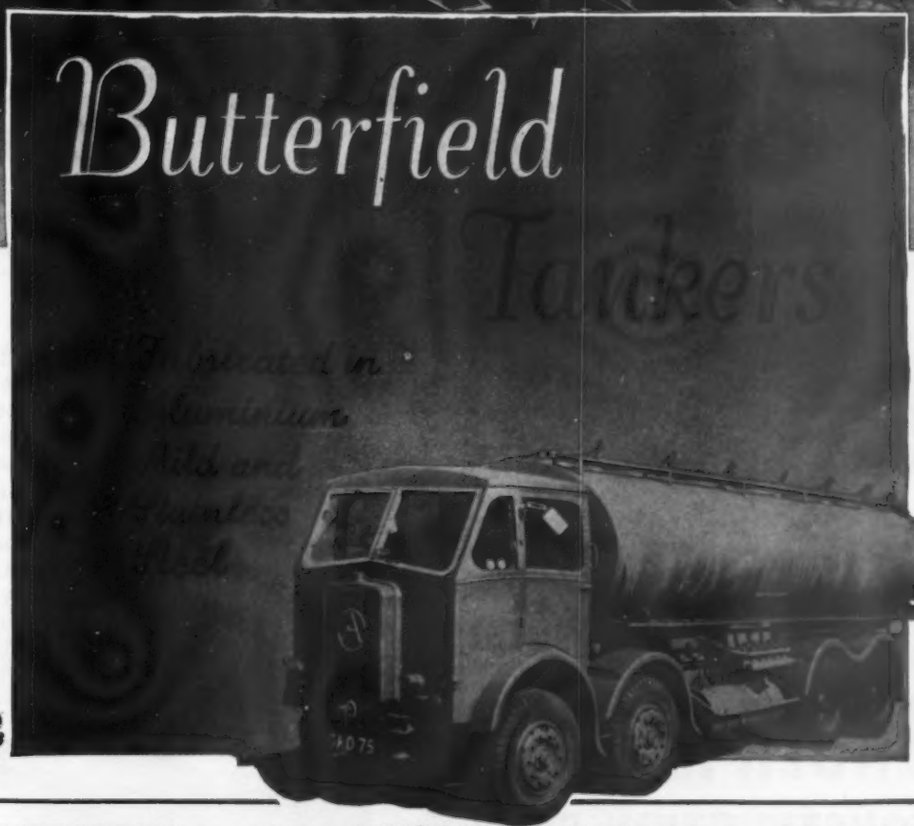
LINES OF COMMUNICATION - - -

On Transport hangs communication, and thereby co-operation, the essential which must not be allowed to "go west." To keep things moving these sturdy Butterfield Road Tanks are going East





Illustrated Above: Part of an order of 500 gallon Petrol Tanks fabricated by Butterfields, mounted on Trailers and ready for shipment to Iran for the Anglo-Iranian Oil Company.

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George B. Gorless

George B. Corless has resigned from Humble Oil and Refining Company, Houston, to head up the executive development program of Standard Oil Company (N.J.) Mr. Corless had been with Humble since 1927. He is a past chairman of the petroleum division of the American Institute of Mining and Metallurgical Engineers.

The Jersey Standard program of executive training seeks to develop a reserve of skilled management men. Training is based on continuing analysis of executive functions and personnel by committees. Gaps in the experience of selected men is filled by proper assignments. The company expects to have a surplus of manpower at some levels but believes that the added cost will be justified in the long run.

Houdry Moves New York Offices

Expansion of engineering and service facilities have necessitated the removal of New York offices of Houdry Process Corporation to new and larger quarters, 25 Broad Street, New York 4. Located at the New York address will be R. B. Cragin, Houdry vice president, together with his staff of commercial development engineers, the Houdry process design and project analysis divisions. Former address was 115 Broadway.

The change will not affect other divisions of the Organization. These include offices at Wilmington, Del., and Philadelphia, Pa., laboratories at Marcus Hook, Pa., and catalyst manufacturing plants at Paulsboro, N. J.

Appoints New Chief Engineer

E. R. Gilmore, who has been chief engineer of Emco Products, has been appointed chief engineer of The Pittsburgh Equitable Meter Division of Rockwell Manufacturing Company. He will be in charge of engineering and development of the meters and regulators for gas, gasoline and oil. He joined the company in 1936.

GROVER F. ILGEN, 58, vice president and general sales manager of Airetool Manufacturing Co., Springfield, Ohio, died August 27, 1946. He had been associated with the company since its organization in 1930 by W. T. Hamilton, Airetool's president. Through his travels here and in Latin America as Airetool's representative Mr. Ilgen became one of the best known figures in the tube cleaning and tube rolling industry. For years he had served the major refineries of the United States and Mexico as a consultant on tube cleaning and tube rolling problems.

WALLACE B. CURTIS has been appointed to the newly created position of public relations director of General Petroleum Corporation. He has been advertising manager for the past fourteen years and previously spent eight years in other marketing activities for General.

THE STANDARD OIL COMPANY (Indiana) has announced the appointment of three new assistant directors of research. J. E. Seebold is assistant director in charge of process design and exploratory economics, Nathan Fragen assistant in charge of pilot plant development work and B. H. Shoemaker in charge of laboratory research on the production of chemicals from petroleum.

Atlantic Official Dies

Paul Shuman, 62, treasurer and member of the board of directors of The Atlantic Refining Company, died suddenly August 22.

Mr. Shuman joined the accounting department of Atlantic in 1920, was named assistant treasurer in 1929 and treasurer in 1937. He was elected to the board of directors in 1939.

Heads Graver Construction

Edward B. Heyden has been named to head the construction division of the Graver Tank & Mfg. Co., Inc. Active in construction work since 1920, Heyden has been associated with The Lummus Company for the past 14 years. He replaces Lloyd K. Wells, who is retiring. The Company also has made John E. Fogarty general manager of its Sand Springs, Okla., plant. Mr. Fogarty formerly was manager of the East Chicago weldment division.

Here's the Story
Not the full story, we admit; it does not concern itself with detailed technical information but it does illustrate the flexibility of the Callender-Hamilton Bridging System for road, rail, foot or cable-carrying bridges in any part of the World. Write for publication No. 206 J on Callender-Hamilton Briages.
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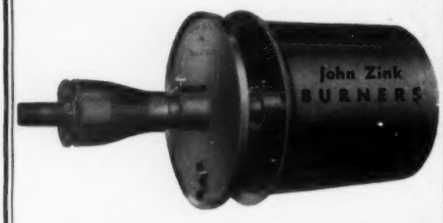

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Completes New Plant

Gulf Oil Corporation has completed its new Girard Point, Philadelphia, catalytic cracking plant and placed it in operation along with auxiliary distillation and other equipment. Crude capacity of the plant is increased 30,000 barrels to 88,000 barrels daily. M. W. Kellogg Company and The Lummus Company acted as engineers and constructors on the project.

The new catalytic cracker is reported to be the largest yet erected by the oil industry. It will process charging stock from 75,000 barrels of crude daily providing a yield of 45 percent high octane gasoline based back on crude. Auxiliary equipment includes a gas recovery plant, alkylation unit, atmospheric and vacuum topping stills, cooling towers, steam plant, refrigeration equipment, and storage.

Clyde Foster

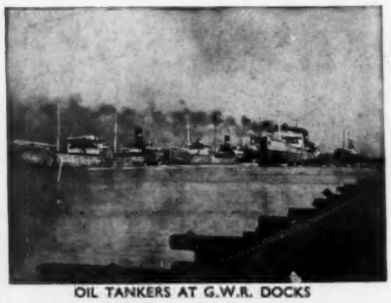
CLYDE T. FOSTER has been elected vice president in charge of finance and accounting and a director of The Standard Oil Company (Ohio). He succeeds William J. Semple as director. Mr. Semple has retired.

Mr. Foster joined Standard as special assistant to the sales manager in 1929 and successively held the positions of manager of the service station department, manager of the operating department of the sales department, and assistant to the president. He was named vice president in January 1946.

COLONEL JAMES H. WRIGHT, deputy director of the fuel and lubricants division of the Quartermaster General's Corps, has returned to Coastal Oil Company as assistant to the vice president in charge of operations at Newark. He was called as a reserve officer in 1940 and entered the service as a First Lieutenant. He was among the vanguard troops to land on the Normandy beachhead on V-E Day and he served through the campaigns of Normandy, and Northern France. Among his awards are seven battle stars, the Silver Star, Legion of Merit with Cluster, Bronze Star, French Legion of Honor, Croix de Guerre with Palms and the Army Commendation Ribbon.

OIL DISTRIBUTION

The Great Western Railway Company's South Wales Docks at CARDIFF, SWANSEA, NEWPORT, BARRY, PORT TALBOT and PENARTH (Harbour) are excellent terminals for oil distribution.



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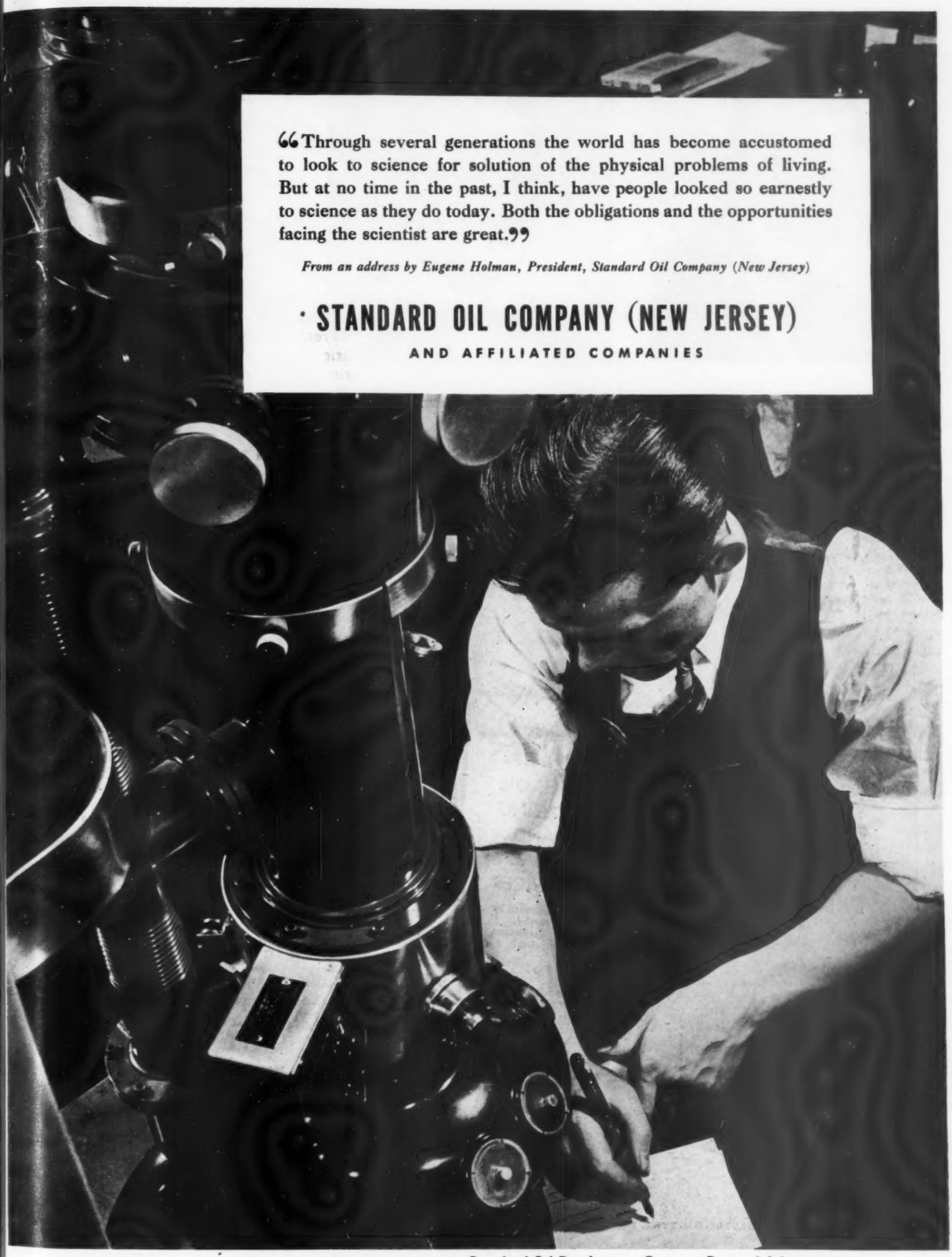

"Through several generations the world has become accustomed to look to science for solution of the physical problems of living. But at no time in the past, I think, have people looked so earnestly to science as they do today. Both the obligations and the opportunities facing the scientist are great."

From an address by Eugene Holman, President, Standard Oil Company (New Jersey)

· STANDARD OIL COMPANY (NEW JERSEY)

AND AFFILIATED COMPANIES

Operating an electron microscope in Standard Oil Development Company Research laboratories.

Dr. P. J. Merkus, Jr.

DR. P. J. MERKUS, JR., until recently manager of the research and development department, Shell Oil Co., Inc., New York, has been appointed assistant to the vice-president in charge of manufacturing. Dr. Merkus succeeds H. D. Dale who was appointed manager of the company's Wood River, Ill., refinery. F. C. Cutting, assistant manager of the research and development department, succeeds Dr. Merkus as manager.

Roy W. Faulk, former assistant superintendent at the Norco refinery, has been named assistant superintendent at the company's Houston refinery. He will be in charge of the topping, cracking and dispatching departments. John B. Dunlap, manager of the cracking department at the Houston refinery, succeeds Faulk as assistant superintendent at Norco.

F. C. Cutting

Joins Clark Brothers

T. R. FOSTER has joined Clark Bros. Co., Inc., at Olean, N. Y., where he will head up Clark's centrifugal compressor sales department. The company also has added Joe Y. Allen as engineer to the technical service department at Houston.

NORMAN S. McCAUSLAND, for 17 years assistant treasurer of The Atlantic Refining Company, has been elected to the board of directors and named treasurer of the company to take the place of the late Paul Shuman. Mr. McCausland joined Atlantic in 1917, as secretary to the treasurer. He became assistant treasurer in 1929.

U. S. Exports-Imports

Imports of oil into the United States for the first six months of 1946 amounted to 66,874,000 barrels, an average of 3,670,000 barrels daily. This compares with a total of 54,050,000 barrels for the first half of 1945. Statistics for corresponding periods of the two years as reported by the Bureau of the Census are as follows:

IMPORTS
(thousands of barrels)

	June		Jan. - June	
	1946	1945	1946	1945
Crude	6,268	6,090	43,901	31,673
Fuel Oil	4,237	4,431	22,973	22,377
Total	10,505	10,521	66,874	54,050

Of the 1946 imports 88 per cent came from Venezuela and Netherlands West Indies. Of the remainder 11.7 percent was supplied in approximately equal amounts by Colombia and Mexico.

Exports from the United States for the month of June and for the first six months of 1945 and 1946 have been as follows:

EXPORTS
(thousands of barrels)

	June		January-June	
	1946	1945	1946	1945
Crude	3,401	2,988	18,036	14,689
Fuel Oil	4,035	5,673	19,533	22,602
Gasoline	2,196	9,379	21,636	60,937
Total	9,632	18,040	59,205	98,328

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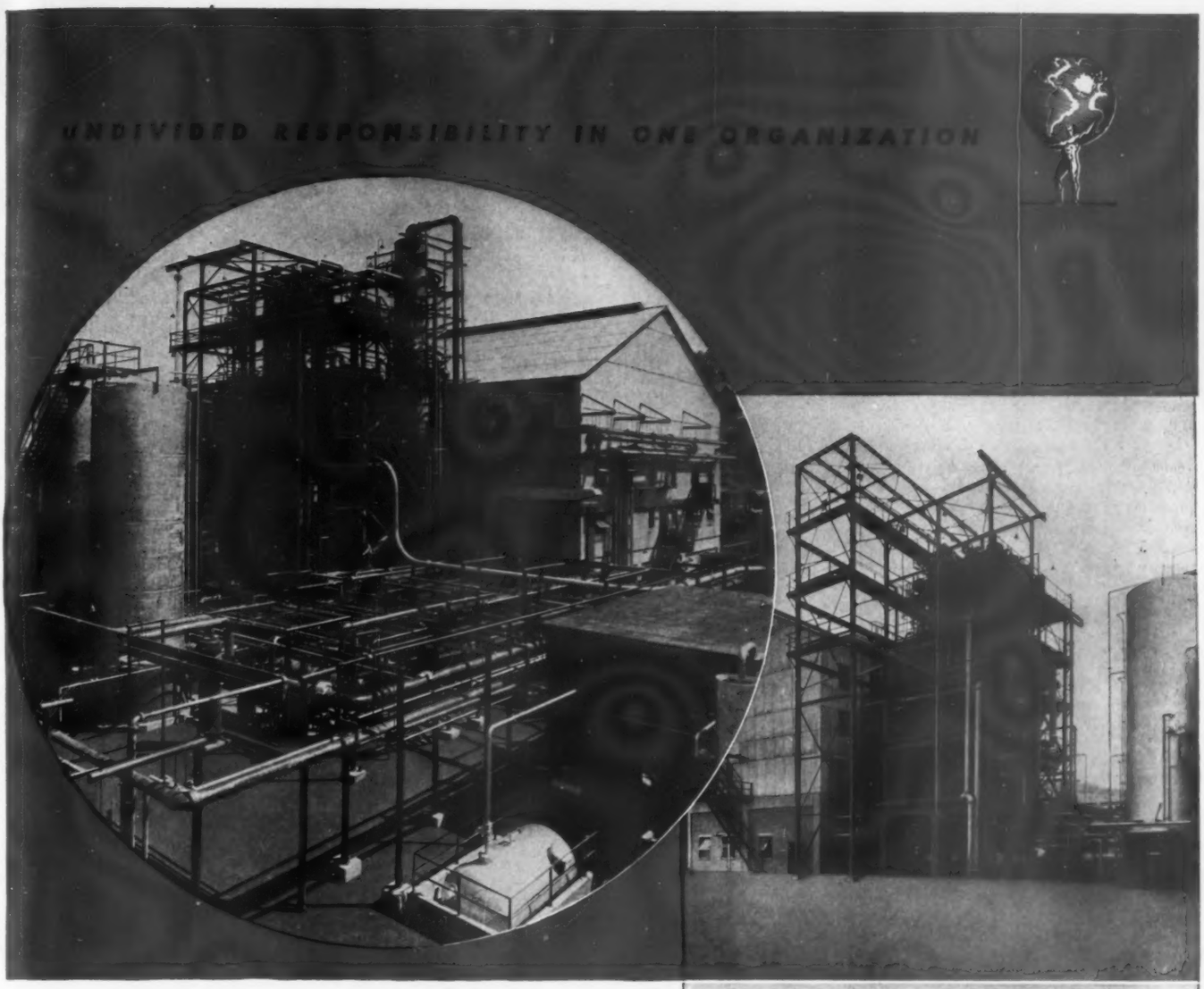
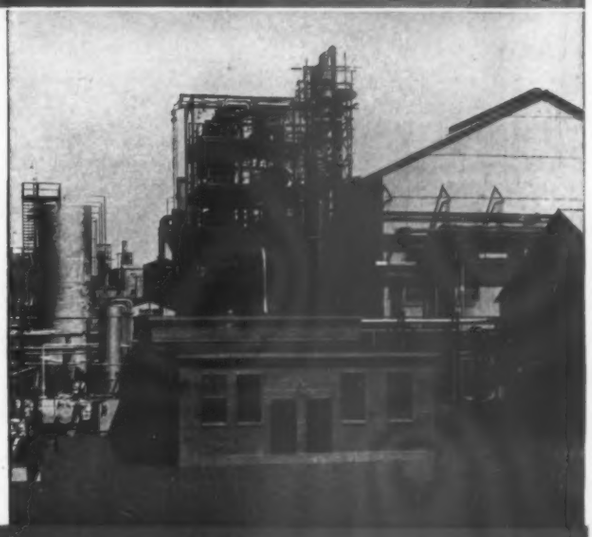


M·E·K SOLVENT DEWAXING PLANT

The photos on this page show three views of a 2000-barrel M·E·K Solvent Dewaxing Plant recently designed, engineered and constructed by Arthur G. McKee & Company under a Texaco Development Corporation process license.



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Indoor Road Testing

Gulf Oil Corporation has developed a road test dynamometer for indoor study of motor fuels and lubricants. The apparatus is capable of reproducing all road conditions except unwary chickens. Even an artificial wind is provided.

S. G. LOY, assistant controller of the Humble Pipe Line Company, has been elected president of the Houston Control of the Controllers Institute of America. At the same meeting E. C. Breeding, controller of the Texas Company, was elected vice-president and D. R. Boggs, chief accountant of the Standard Oil Company of Texas was elected secretary-treasurer. At the annual meeting of the Dallas Control of the organization, E. Clyde Seymour, controller of the Magnolia Petroleum Company, was elected president.

DWIGHT F. BENTON, assistant general manager of sales for the Rocky Mountain division of Standard Oil Company (Indiana) with headquarters at Denver, Colo., will be transferred October 1st to assistant general manager of the lubricating and sales technical service departments in the Chicago general office. He will serve under L. C. Welch, general manager of the lubricating and sales technical service departments.

Singapore Container Plant

Rheem Manufacturing Company has formed an association with Hume Pipe Far East Ltd., to operate a steel shipping container plant at Singapore, Malay Peninsula, for the petroleum, latex and palm oil industries. The new company, Rheem-Hume Ltd. is capitalized at $400,000 and was organized during a recent visit to Singapore of W. E. Zander, Rheem vice president in charge of foreign operations. Machinery built in Rheem's Stockton, Calif., plant already is on the ground and is being installed.

AUBREY T. GHOLSON, sales manager for Hovey Petroleum, Houston, was elected vice-president of the oil export and import firm, Dan Hovey, president, announced. Gholson joined Hovey Petroleum Company immediately after he was discharged from the Army in September, 1945. Recently import and export sales have been greatly expanded and the company now has representatives in South America and Mexico.

MORGAN J. DAVIS, chief geologist of Humble Oil and Refining Company, has been made manager of the exploration department in addition to his previous duties; C. E. Reistle, Jr. has been named manager of the production department; Ray H. Horton has been appointed manager of the industrial relations department; and D. F. Haynes has been made manager of the crude oil department. R. C. Barbour, former East Texas Division production superintendent, has been made general superintendent of the production department, succeeding Mr. Reistle.

C. W. DeLancey has been named superintendent of the Gulf Coast division, production department, succeeding G. B. Corless, resigned. R. E. Bridges, formerly Gulf Coast division engineer, will take over Mr. DeLancey's old duties as assistant superintendent, Gulf Coast division. R. J. Schilthuis, former division petroleum engineer in the Southwest Texas division, will assume the newly created position of assistant superintendent of the natural gas division of the production department.

H. S. Warner and K. R. Dailey have been appointed assistant managers of the industrial relations department; both are newly created positions.

Two new positions of assistant chief geologist have also been created and added to the staff of chief geologist Morgan J. Davis. J. Ben Carsey, formerly division geologist of the Louisiana - Mississippi division, and Ed. J. Hammer, formerly assistant division geologist in the Southwest Texas division, have been named to fill the new posts. Mr. Carsey will be in charge of exploration work and Mr. Hammer of production geology and geological problems related to development.

New Shell Manager

Col. Leslie Forster has been appointed general manager of Shell Oil Co. operations in Colombia. He succeeds H. S. M. Burns, manager for the past ten years, who is being assigned to an executive position in the United States. Col. Forster has served Shell in Mexico and in the Near and Far East as well as in London.

Recovery in Holland

Reports from the Netherlands indicate that rapid progress is now being made in the restoration of industrial plants to full operation. During the war most of these works suffered severely from incendiarism or from bombing attacks by Allied planes in the final drive on the German forces. For example, the main establishment of G. Dikkers & Co. at Hengelo, leading manufacturers of valves and fittings for oil refineries and power plants, occupying a site of 20 acres and giving employment to 1,200 persons, was spared in the Nazi invasion but later was repeatedly bombed with great damage to the shops and complete destruction of the main office. As soon as the Germans were driven out reconstruction began and production was shortly put under way. A new and larger foundry for non-ferrous metals and a more extensive head office are being built. Manufacturing operations which were centered first on gate valves are being extended to cover a full line of products.

T.S.M.V. PETRONAVE, built as a Mark VIII L.C.T. and converted to oil tanker for the Eagle Oil Company, London, by the Warrenpoint Shipyard Company Limited. Powered by four 500 h.p. Paxman diesel engines, it has a capacity of 1,440 tons of oil and accommodation for 36 officers and men. Your enquiry about any shipbuilding or conversion work will be welcomed.

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